

A CHILTON PUBLICATION

# The Iron Age

OF MICHIGAN

NATIONAL METALWORKING WEEKLY

APR 13, 1953

PAGE 2

EAST ENGINEERING



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“Q”

**Quality** . . . that costs no more is yours when you choose Fairbanks-Morse Side Suction Centrifugal Pumps. Extensive engineering laboratories . . . production line methods with precision machining of all parts enable Fairbanks-Morse to offer you a side suction centrifugal with the design, workmanship and performance normally obtained only in highest quality split-case pumps.

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For a “cue” to better pump performance, choose the pumps that spell quality with a capital “Q” . . . Fairbanks-Morse Side Suction Centrifugals. Fairbanks, Morse & Co., 600 S. Michigan, Chicago 5, Ill.



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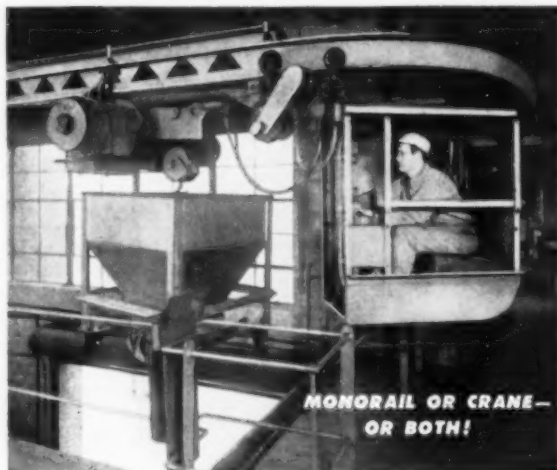
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**WHITING**  
**TRAMBEAM® OVERHEAD**  
**HANDLING SYSTEMS**

Elbow room for men and machines! This Trambeam crane system is one of seven installations speeding work in Reliance Electric & Engineering Company's Euclid, Ohio, plant.



**MONORAIL OR CRANE—  
OR BOTH!**

Trambeam is flexible handling . . . adaptable to present and future needs with monorail systems (like the foundry installation shown here) for efficient overhead point-to-point transport, or crane systems for complete area coverage.

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Keep house with Whiting Trambeam! Get fast, flexible overhead handling that helps you increase plant capacity, speed production and step up profits! Trambeam works overhead and out of the way . . . serves receiving and shipping, assembly and storage. You get more room for work . . . and more work! It's tailor-made handling, engineered to your specific needs, adaptable to future requirements! Write today for illustrated operation reports and complete information.

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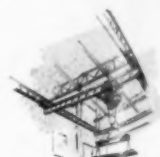
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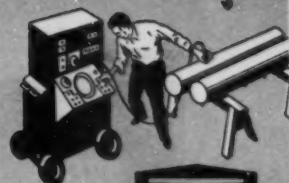


Overhead Cranes

Also: AVIATION, FOUNDRY AND TRANSPORTATION EQUIPMENT—SWENSON EQUIPMENT  
 FOR THE PROCESS INDUSTRIES—METAL-WORKING MACHINERY

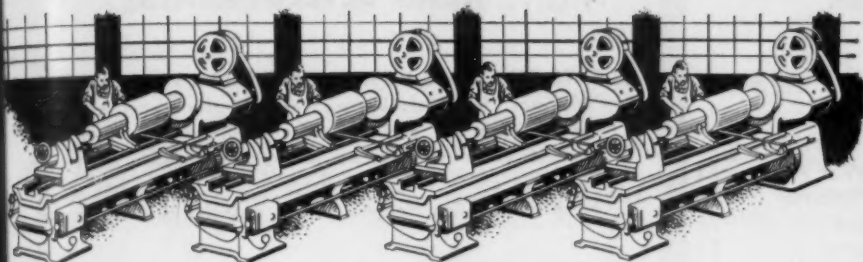


# Tool Steel Topics



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

The Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



## Output up 150 pct with Red Sabre Bits

Four identical lathes, side by side, produced identical parts in one of our customer's shops. Using both high-speed steel and carbide tool bits, the rate per shift was set at 150 pieces per machine by the time-study engineers.

One of the lathe operators heard about our Red Sabre tool bits from a friend. So he brought one to work and began using it. He surprised himself by finishing 325 pieces in one shift, earning a nice bonus.

When he kept up his high rate, the payroll department began to ask questions. But a check-up showed that the operator's production was being reported correctly. In fact, his output increased to an average of 370 pieces.

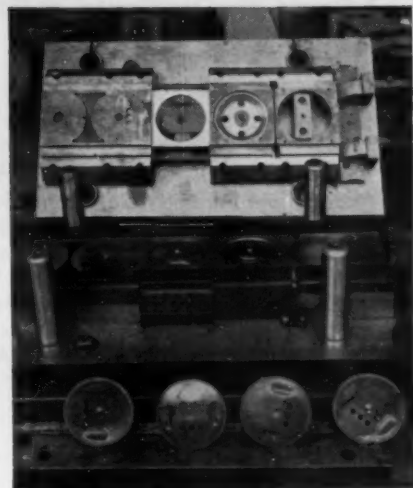
When the time-study men got to the

bottom of the mystery they really became enthusiastic. Red Sabre bits were installed on all four lathes. Output reached as high as 400 by increasing speeds and feeds.

Red Sabre bits are mighty popular in this shop because both the machine operators and the management are reaping the benefits of the increased output.

Red Sabre is our super high-speed steel. It has more wear-resistance and higher red-hardness than run-of-the-mill tool bits. Red Sabre tool bits, hardened to a minimum of Rockwell C-65 and ground accurately, are available in all standard sizes.

Like to try them in your shop? Order a couple from us at Bethlehem, Pa., or ask your distributor about a trial.



### HIGH-PRODUCTION DIE

This blanking, drawing, and forming die is made of high-carbon, high-chromium tool steel (our Lehigh H) to make possible long production runs. Operated in a 350-ton press, it produces end caps for a refrigeration unit. Hardened to Rockwell C-60, this die turns out about 100,000 pieces from 3/16-in. steel strip before redressing is needed. An air-hardening grade of tool steel, Lehigh H provides very high wear-resistance and the least amount of distortion during heat-treatment.

### BETHLEHEM TOOL STEEL ENGINEER SAYS:



Remedy those fatigue-failures

Tools such as chisels, that are subjected to repeated stresses, often fail suddenly. As the tools are made from shock-resisting steel, these sudden failures can look mysterious. But close examination of the failed parts will often reveal that the failures were actually not sudden but occurred by progression of a crack part way through the section, followed by sudden fracture of the remaining section.

Fatigue-fractures have a characteristic, smooth-rubbed surface where the initial crack opened up, and an inner crystalline zone revealed by the final sudden break. Often the smooth-rubbed surface shows parallel "oyster-shell" markings, and may even show evidence of rusting.

Fatigue-failures usually begin at a stress-concentration point. This may be a notch, a poor fillet, tool mark, accidental nick, or a stamping. Correcting such design or mechanical faults is the cure.



(Left) A kitchen-ware maker uses BTR<sup>®</sup> for the die that blanks and draws .032-in. aluminum to accurate size. The fit between the die halves is held to close tolerance to assure proper flow of metal during the one-stroke draw and to produce a smooth surface. This die has produced more than half a million pieces.



(Right) In a single operation these piercing dies, made of our BTR<sup>®</sup> tool steel, put 125 holes in the aluminum accessory for pressure cookers shown at the right. The punches were in excellent alignment after heat-treatment, and showed little evidence of wear after producing 165,000 pieces without requiring regrinding.

BTR is an economical, general-purpose tool steel. Oil-hardening, it's easy to machine and heat-treat. Tough and wear-resisting, it's low in distortion.

# The Iron Age

Vol. 171, No. 15, April 9, 1953

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# DIGEST of

## NEWS DEVELOPMENTS

### SAVE ON ALLOYS NOW, HAVE ENOUGH FOR WAR—P. 73

"Hot war" has a double meaning. It also means a war of special steels and alloys to meet rougher heat and strength demands of an improving war technology. On some of our war alloys we are in long-term danger. The military has set up harsh conservation measures. Other agencies build up sources.

### FOREMEN GO TO FREE ENTERPRISE SCHOOL — P. 75

Over 1000 veteran steelmakers will soon get diplomas. They will be graduates of a course in the American economic system sponsored by Youngstown Sheet & Tube. The students, company foremen, learn why America is the land of plenty, how firms operate. Typical answer on graduation is, "Give us more."

### WOMEN COULD SOLVE ENGINEERING SHORTAGE—P. 79

Industry needs 30,000 new engineers each year—and it's willing to pay them good salaries. But industry has done little about the biggest potential source—women. Of 105,000 who graduated in '52, only 52 had engineering degrees. Industry can do a lot, but parents and educators can do most.

### AID PLEDGED ON VENEZUELAN STEEL MILL — P. 85

Venezuela's national aspiration to establish its own steel industry is moving from the dream stage to the decision stage. Step one was formation of Iron Syndicate. Step two, and probably just as important, was U. S. Steel Corp.'s promise of assistance. Site may be river junction where power's planned.

### DETROIT IS TOOL & DIEMAKING CENTER TOO — P. 90

Over 20 pct of all U. S. tool and diemakers work in the Motor City area, a Labor Dept. survey shows. Their products are essential to mass production automaking, and the industry has thousands busy in captive and job shops. Job turnover is low and infrequent. But long apprenticeships are under fire.

### KEEP YOUR MOUTH SHUT ON DEFENSE WORK — P. 95

Leakage of military secrets isn't all the fault of the Armed Forces. Competition among defense contractors also accounts for security leaks, says Defense Secretary C. E. Wilson. He's ordered tighter censorship over war work data. Mr. Wilson was reportedly burned up about newspaper disclosures.

# f the Week in Metalworking

## ENGINEERING & PRODUCTION

### WHICH GRAY IRONS FOR HIGH PRODUCTION?—P. 131

Tool-life tests show machinability of high-phosphorous gray irons compares favorably with low-phos irons. Steadite has no adverse effects on machinability. In alloyed irons, the presence of nickel has a beneficial effect on machining properties. Carbide-stabilizing effect of chromium reduces tool life.

### DRAW SPEEDS AFFECT PROPERTIES OF WIRE—P. 135

Wire-drawing speeds affect the electrical properties of 18-8 drawn stainless steel wire. Very high drawing speeds may not permit adequate cooling between dies. This affects magnetic measurements, remanence and coercive force, tensile strength and specific resistance.

### SHOP OWNERS PACK WESTERN METAL SHOW—P. 139

Owners and engineers from thousands of small shops made the Western Metal Show the biggest to date. Ultra high-strength steels, titanium and zirconium grabbed the spotlights in the technical sessions. Numerous "made in the West" and foreign machine tools were shown.

### MACHINERY MARKET BOOMS FOR PLASTICS—P. 142

Use of extrusion machines has increased in recent years. Low production cost is prime reason. Production of 500 extruders in 1952 required 5 million lb of metal, exclusive of motors and other devices. Users of extruders also needed 5 million lb of metal for granulators and other accessory equipment.

### HOW TO GET BETTER GLASS-TO-METAL JOINTS—P. 146

The tough job of hermetically sealing a glass-to-metal joint is best done by resistance welding. Heated areas are small and welding time may be only 1/20 sec. There is no flux to contaminate the sealed enclosure. Intergranular penetration and alloying between metals provide a strong bond.

### NEXT WEEK—DUAL-FREQUENCY HEATING CUTS COSTS

A new concept in induction heating, using dual frequencies, has reduced capital outlay and operating costs. Two sets of continuous coils are used. One man heats 200 billets per hr to forging temperature. Reduced scale loss saves 300 lb of steel per hr. Space requirements for equipment are small.

## MARKETS & PRICES

### INDUSTRY IGNORES BUSINESS PESSIMISM — P. 76

Plant expansions in the Midwest go on unabated despite warnings of danger to production. Titanium plant is slated to be built in Tennessee. Many other firms that are growing or diversifying their operations are listed. Fabricators report structural backlogs equal two-thirds of 1952 volume.

### STRIKE CUT 1952 STEEL PROFITS 22 PCT. — P. 80

The Iron Age Financial Analysis of the steel industry shows earnings off about 22 pct in 1952—second straight year that profits have dropped. The 54-day strike was the cause. But industry rebounded and records were toppling in the second half. Government taxes dropped 64.8 pct.

### MAGNESIUM INDUSTRY DISPLAYS ITS WARES — P. 81

The First International Magnesium Exposition was held in Washington last week. With production running well ahead of consumption, the industry is doing a big sales job. Aim is to educate the public and industry. Many products were shown and assembly line production techniques were demonstrated.

### TOOL BUYERS WILL WANT MORE AUTOMATION—P. 101

Mass producers will be seeking more highly automated machine tools as a way to reduce costs and to increase production per sq ft of floor space. One machine tool manufacturer is working on a program to automate grinding machines. Auto industry is expected to be the first to make use of these units.

### STEEL STRIKE RAISED TRUMAN BUDGET DEFICIT—P. 167

The Truman budget deficit would have been a billion dollars less had it not been for the steel strike last summer. Steel industry's federal taxes in '52 were \$427 million against \$1213 million in '51, a 64.8 pct drop. Industry earnings fell from \$638 million to \$496 million, a 22.3 pct skid.

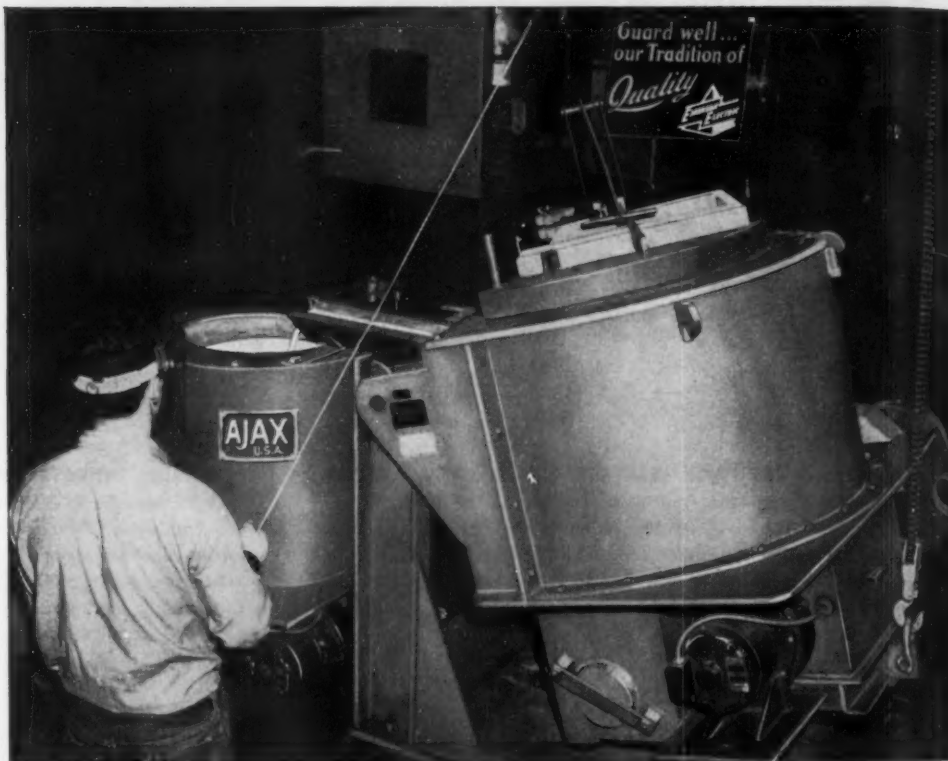
### COPPER MINE PRODUCERS ALL AT 30¢ PER LB—P. 170

Last week Kennecott and Anaconda brought their copper prices into line with Phelps-Dodge. One action was a boost, the other was a reduction. Custom smelter move seen near as scrap buying prices descend to level of 30¢ copper. But foreign metal will take a long time to come down to U. S. levels.

Closer Temperature Control, Cleaner Aluminum, Cooler  
and Less Congested Conditions Are Obtained With

# AJAX TAMA-WYATT *Induction Furnaces-*

Thousands of die cast rotors for hermetic motors are made from pure aluminum poured from a battery of AJAX Electric Induction Furnaces installed in the St. Louis plant of the Emerson Electric Mfg. Co. Two of these furnaces are shown in the photograph at right.



Close-up of die-cast aluminum rotor which is pressed onto the compressor shaft extension used in refrigeration units.

Our electrical industry produces fractional horse power motors at the rate of 20 to 25 millions per year. After World War II the leading manufacturers changed from fabricated copper rotors to cast aluminum rotors. In this operation, aluminum of high purity under closely controlled temperature is required. In many cases the ma-

chines had to be placed right on the assembly line, with severe space restrictions and, of course, with rigid requirements for reliability. AJAX induction furnaces and AJAX automatic pouring units were selected for this job in almost all the plants which switched from copper to aluminum rotors.

Send for further information to

AJAX ENGINEERING CORP., TRENTON 7, N. J.

## AJAX

TAMA-WYATT



## INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies  
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## Editorial

*The Iron Age*

FOUNDED 1855

## Lead From Strength

LET'S assume that the Russians want peace. So do we—but for a far different reason. We are interpreting the latest peace offensive in the light of our own views on peace—peace so we can go ahead with the job of striving for a constructive, progressive and happy life for our people. That is what the Russians want us to do. As long as we react that way they can use the peace drive for their own purposes.

No one knows what goes on in the minds of the men in the Kremlin. But it is a sure bet that what they want is not what we want. The peace drive is for one purpose—to help the communist drive for world domination.

They are trying to split the free powers. They want thousands of people in high places here to believe that we will have a depression because of peace talk.

The Russians hope peace talk will cause us to stretch out our defense program, drop good projects, close our eyes to what is really going on. That's what Malenkov & Co. want.

If we forget that the world is divided into a slave camp and a free camp we are lost. If we think butter should completely replace guns we are lost. If we interpret Russian moves in the light of our own way of life we are doomed.

Since we are a democracy and want peace we must always be at the beck and call of the Communists. We can't call the shots. All we can do is try to figure out what they are doing and why. So far our score is not very good.

The Communists want, and expect, to rule the world some time. They are in no hurry because the stake is great. They will use everything they can, be it peace, war or turmoil, to gain that end.

We cannot afford to sit around with an inadequate air force, a small army and a half-built stockpile of strategic materials as long as we know what the Communists are up to.

The Russians will always call the shots. If we meet them from strength we will win out. If we lead from weakness and fear, they will win—always.

*Tom Campbell*

Editor

April 9, 1953

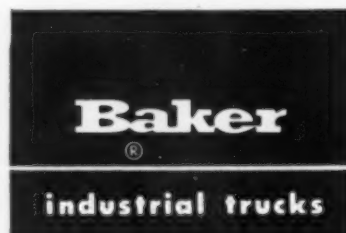


## New Ford Foundry speeds handling with **BAKER TRUCKS**

■ A sizeable fleet of Baker 6000-lb. capacity Fork Trucks helps maintain the production pace in the new Cleveland Ford foundry. The trucks are of the "FT" type, designed for 100% functional, efficient, safe, low-maintenance operation. They are used interchangeably on a wide variety of jobs, moving many materials that cannot be piped, conveyed or transported by other automatic methods. Most such materials are palletized for fork-truck handling.

They unload incoming bulk materials such as sea

coal, bond, drums of oil and other liquids, tier them in storage or in areas near their points of use. They haul supplies to metal and molding departments and to other production operations. They haul finished products from ends of production lines to scales for weighing, and then to storage. Palletized engine blocks are taken from conveyors to temporary storage awaiting transfer to adjacent engine plant. They load cast flywheels onto highway carriers for shipment to the Ford Rouge plant.



*write for*

your copy of the "Baker Handling Library", a portfolio of case histories showing actual cost savings in foundries and other plants.

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*The Baker-Lull Corporation • Subsidiary, Minneapolis, Minn.  
Material Handling and Construction Equipment*

# Dear Editor:

## Letters from readers

### What Next?

Sir:

We have been taking your magazine now for more years than we care to remember. Not forgetting for a moment all the splendid articles that are a consistent feature of this paper, there is one high point we look for and read first, namely, your editorial.

I don't believe I have ever read a better editorial than that in your Mar. 12 issue, "What Next?" You probably get so many complimentary letters on these editorials, nevertheless an extra pat on the back shouldn't come amiss.

We look forward to your next editorial.

R. E. LAWRENCE

A. R. Williams Machinery Co., Ltd.  
Toronto, Ont.

### Fused Coatings

Sir:

We would appreciate learning more about the "sprayed on fused coatings of wearproof alloys" as mentioned on p. 69 of your Mar. 26 issue.

Will you kindly advise us as to where we may secure this information?

R. W. MELDRUM

Meldrum Mfg. & Engineering Co.  
St. Paul

Further information may be obtained from L. V. LaRou, chief engineer, Wall Colmonoy Corp., 19344 John R St., Detroit.—Ed.

### Wire Drawing Problem

Sir:

In your Mar. 19 issue we noted on p. 69 an item which was of particular interest to us concerning the electrical properties of stainless steel wire in relation to wire drawing speeds.

We are wondering if there is available a treatise on this subject or if you could direct us to someone who has done research on this subject.

R. S. GOULD

General Spring Co.  
Cincinnati

An article on this subject appears on p. 135 of this issue. For more details write to Sylvania Electric Products, Inc., 2021 Francis Lewis Blvd., Bayside, N. Y.—Ed.

### Aluminizing

Sir:

Being associated with the firm of Soc. Galvan in Italy, I have had the pleasure of reading some of your articles regarding protective coatings on steel.

I am very much interested in collecting data and literature on the

subject of aluminizing, with particular reference to the hot dip process. I have already contacted some large companies but so far I haven't been able to trace some really detailed information.

While I understand the reluctance of some firms to release information concerning their methods, and since I believe you are an expert on the subject, I would feel extremely obliged if you could give me some lead as to where I can best secure some literature.

A. D'ANDREA

Hoboken, N. J.

We published an article describing the GM Research Laboratories process for aluminum dipping in our June 12, 1952 issue, p. 115. A paper on the subject was presented before the SAE in Detroit last January, a copy of which may be obtained from the Society of Automotive Engineers, 29 W. 39th St., New York.—Ed.

### Hot Machining

Sir:

We would appreciate receiving any information that is available relative to hot machining of steel. If such is not available in your files perhaps you could tell us where to direct our inquiries.

G. C. GENTRY  
Asst. Chief Engineer

Edgewater Steel Co.  
Pittsburgh

We have published the following articles on hot machining of steel: Apr. 28, 1949, p. 67; July 21, 1949, p. 78; and Feb. 9, 1950, p. 71.—Ed.

### Clamping Shell Molds

Sir:

In your Jan. 29 issue you mention that someone was allowed a patent on a mechanical clamping device for holding together shell molds. Can you give me the number of this patent and also the party's name?

H. W. DIETERT

Harry W. Dietert Co.  
Detroit

Complete information on the device can be obtained from the Chicago Powdered Metals Co., Franklin Park, Ill.—Ed.

### 18-8 Alternate

Sir:

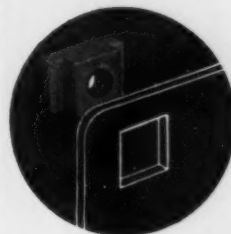
If available, I would appreciate your sending me 15 reprints of the article "New Austenitic Stainless Good Alternate For 18-8," which appeared in the Mar. 12 issue.

J. E. HAYES  
Advertising Manager

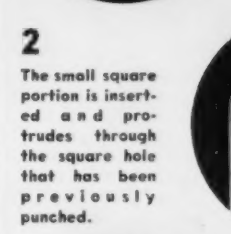
Rigidized Metals Corp.  
Buffalo

## Fast-On CLINCH NUTS

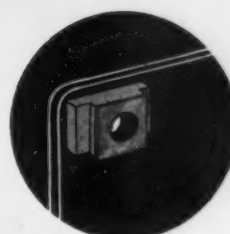
**F**ABRI-STEEL "Fast On" clinch nuts increase thread area and use of lighter gage metal. They cut assembly, using shorter screws and speeding up assembly. Our engineers can help you improve your product. Send for detailed data sheets.



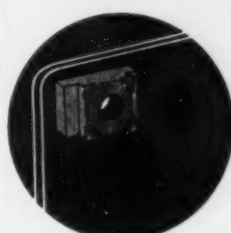
**1**  
The square shape simplifies installation.



**2**  
The small square portion is inserted and protrudes through the square hole that has been previously punched.



**3**  
The protruding portion is now clinched at 4 corners with swaging tool.



**4**  
Nut cannot work loose and variation in thickness of metal is taken care of automatically.



### MILLIONS A DAY!

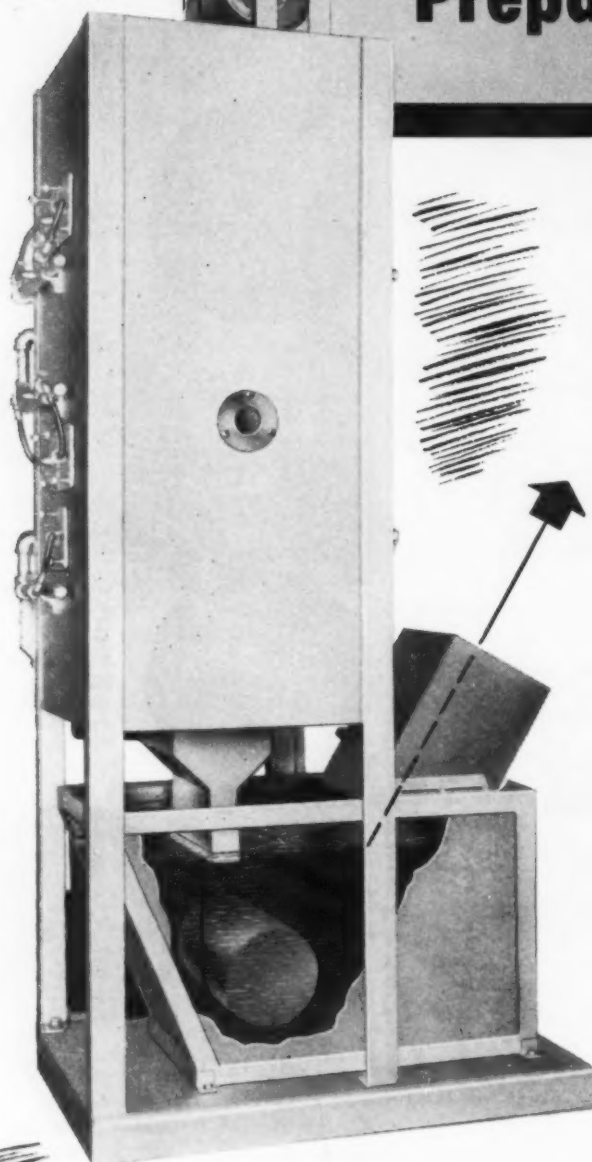
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# Wire Bright Annealed Without Prepared Atmosphere



Controlled combustion of fuel in the Segas gas-fired Gradation furnace produces bright annealed copper wire.

No prepared atmosphere is necessary . . . resulting in a saving in the installation cost of inert gas generating equipment and, equally important, a saving in working area. Accurate control of the gas-air mixture produces a non-oxidizing fuel.

Furnaces are direct fired . . . no muffle, no forced circulation of gases. A copper wire annealing furnace, as shown, has a built-in quenching tank, with provision for coiling the wire immediately after quenching.

Burners are of special ceramic material, compounded to give extremely long life at the designed operating temperature. Typical of the burner durability is the case of one manufacturer who has not replaced a burner during thirteen years of furnace operation.

Furnaces of similar or other designs can be built for heating other alloys. Ask for further details from the factory or your Segas representative.

# SELAS CORPORATION OF AMERICA

PHILADELPHIA 34, PENNSYLVANIA

Heat Processing Engineers for Industry — Development • Design • Manufacture



# Fatigue Cracks

by William M. Coffey

## Fire One

It was an exciting day for everyone in your ffj's office last Mar. 23. There was an air of expectancy that first started clear across the building in the publisher's office, then permeated through the editorial offices, sneaked into advertising and even got as far as Fatigue Cracks, from which much farther than that you can't get.

Tension had been building up for some time. The very air was electric. A stranger would have said, "Nom de plume, but la guerre, elle comes?" Assistants and Associates alike nervously pecked at typewriters, adjusted eye-shades, shirt bands and synchronized watches. THIS WAS IT! THE YUCCA KID WAS RETURNING!

You may well ask, "Mon dieu, who is the YUCCA KID?" and we would answer, "Yea, the one known as the YUCCA KID is Tom Campbell, Editor-in-chief of THE IRON AGE. Verily a pillar, a man of strength. A man who has seen the Atom Bomb bust in Nevada."

You never saw so much scurry, to and fro, when THE KID made his appearance. Questions came thick and fast. "How much did you lose?"



This is a shot of the YUCCA KID on the desert. He had lost his way in going from the Hotel to the Flamingo Club.

## Puzzlers

Here's a very interesting letter received from the Department of Mathematics and Humanism, Grin-

Sir:

There are submitted herewith the correct answers to the problems and puzzles, appearing under the heading of "Fatigue Cracks" in the past issues of "Iron Age."

Problem	Answer
The traveler .....	Length of journey—480 miles. He traveled 14 hrs. at average of 34.286 miles per hour
Ages of ship and boiler .....	Boiler—18 years. Ship—24 years
Beef .....	4800 lbs. of beef
Theatre .....	11 men, 19 women & 70 children
Soldiers .....	24,142 miles
The apple tree .....	24 days
Fisherman .....	1 1/2 mph
Ladders and wall .....	Will submit answer to this as soon as 20 ft. and 40 ft. ladders can be built

Please do not ask questions as to how the above answers were obtained; as it is against the policy of this university to answer such questions as it might tend to incriminate the Head of the Department and be contrary to academic freedom.

R. B. O'Coibhthaidh,  
Head of Department

Did you see Martha Raye? Is Las Vegas anything like Greenwich Village?" And Tom would just sit there, perched on Managing Editor Sully's shoulders, while a few of the copy-boys in the background were quietly singing "For He's a Jolly Good Fellow" in respectful tones.



This is a shot of last year's Fourth of July, celebrated in Tom's backyard. A rather powerful firecracker had just been exploded and Tom, only 7 miles away, caught the burst with his trusty, Pony camera. Notice the guided missiles that Tom uses to measure some things in the large cloud that develops. Rather a nice touch.

A smothered grin would occasionally cross his face as a question would recall some exciting episode. At several queries a look of horror would momentarily scar his handsome features, revealing a painful memory. But for a long time he said nothing. That military look, you know.

Finally, he spoke, "Gentlemen, this is hot stuff. A-1, super-priority secret. I can say nothing at this time. It so happens, however, that I have a few pictures." And that's all we ever learned.

(This is one more effort on our part to escape from writing Fatigue Cracks. If Tom stands for this, we're sunk.)

nell University, Jamestown, R. I. As we get many requests for answer to back problems we welcome the honor of printing it:

THREADED SPECIALTIES

## EYE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes 1/4" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

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"THE BOLT MAN"  
MANUFACTURING COMPANY  
327 Pine Street Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T. M. REG.



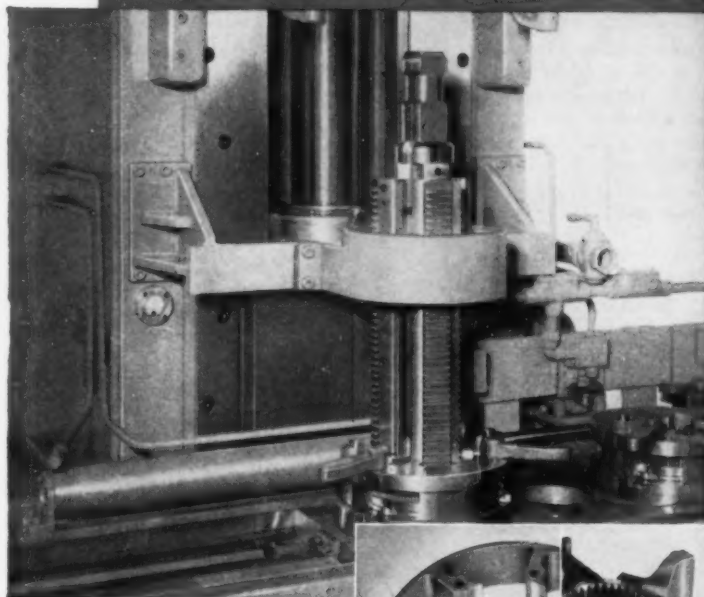
## Unified Broaching

*The New Trend...*

### the COLONIAL method

At Colonial, experience, imagination and competence are applied

- 1 to the design and manufacture of each of the individual components of a complete broaching installation, and
- 2 to the effective combining of ALL components into a completely UNIFIED BROACHING installation—making them work as a "team."



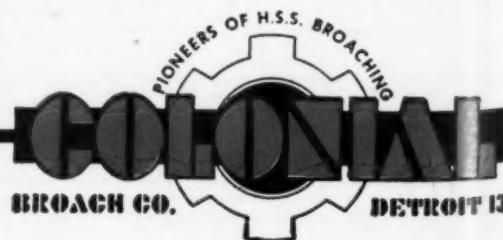
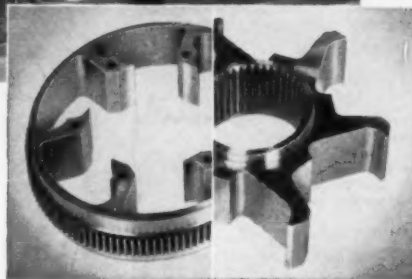
### 3 Colonials Broach Intricate Aero Parts

Three Colonial broaching machines rough and finish broach these two mating aircraft engine parts. Six internal contours on the body are broached on a 15-ton Model RD pull-down (illustrated). The spider's external contours are broached on a Model RS 6-ton single ram and internal involute splines on a 15-ton Model RD pull-down machine.

Machines, broaches, fixtures, etc., were all designed by Colonial as a UNIFIED BROACHING INSTALLATION.

#### WHAT'S AHEAD IN BROACHING?

Keep up with the latest developments: Read "Broaching News". We will be glad to see you get it regularly if you will drop us a line on your company letterhead.



## Dates to Remember

### Meetings

April

**ELECTROCHEMICAL SOCIETY**—Spring meeting, Apr. 13-16, Statler Hotel, New York. Society headquarters are at 235 W. 102nd St., New York.

**AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN., INC.**—Annual convention, Apr. 13-15, Miami, Fla. Association headquarters are at 814 Clark Bldg., Pittsburgh.

**AMERICAN SOCIETY OF LUBRICATION ENGINEERS**—Annual meeting and lubrication exhibit, Apr. 13-15, Statler Hotel, Boston. Society headquarters are at 343 S. Dearborn St., Chicago.

### EXPOSITIONS

**MATERIALS HANDLING SHOW** — May 18-22, Philadelphia.

**NATIONAL METAL SHOW**—Oct. 19-23, Cleveland.

**AMERICAN GAS ASSN.**—Sales conference, Apr. 13-15, Warwick Hotel, Philadelphia. Association headquarters are at 420 Lexington Ave., New York.

**CUTTING DIE INSTITUTE**—Semiannual meeting, Apr. 15, Sheraton Cadillac Hotel, Detroit. Institute headquarters are at 1643 National Bank Bldg., Detroit.

**NATIONAL PETROLEUM ASSN.**—Semiannual meeting, Apr. 15-17, Cleveland Hotel, Cleveland. Association headquarters are at the Munsey Bldg., Washington.

**GRINDING WHEEL INSTITUTE & ABRASIVE GRAIN ASSN.** — Spring meeting, Apr. 16-19, The Homestead, Hot Springs, Va. Institute headquarters are at 2130 Keith Blvd., Cleveland.

**NATIONAL SCREW MACHINE PRODUCTS ASSN.**—Annual meeting, Apr. 18-23, St. Moritz Hotel, New York. Association headquarters are at 2860 E. 130th St., Cleveland.

**METAL POWDER ASSN.**—Annual meeting and Metal Powder Show, Apr. 21-22, Hotel Cleveland, Cleveland. Association headquarters are at 420 Lexington Ave., New York.

**AMERICAN INSTITUTE OF STEEL CONSTRUCTION**—Annual engineering conference, Apr. 22-23, Detroit. Institute headquarters are at 101 Park Ave., New York.

**NATIONAL TOOL & DIE MANUFACTURERS ASSN.**—Spring meeting, Apr. 23-25, Statler Hotel, Washington. Association headquarters are at 907 Public Square Bldg., Cleveland.

**WOVEN WIRE PRODUCTS ASSN.** — Semiannual convention, Apr. 26-28, Grove Park Inn. Association headquarters are at 1721 W. School St., Chicago.

# Yours for

# REDUCED FIRE LOSSES

# CARDOX

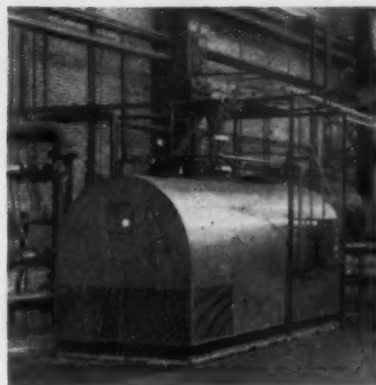
## Experience

The Priceless "EXTRA"

You Don't Pay for in

## CARDOX

Low Pressure Carbon Dioxide  
Fire Extinguishing Systems\*



**EXPERIENCE** is the one thing that can't be copied.

CARDOX originated and created Low Pressure Carbon Dioxide Fire Extinguishing Systems many years ago.

Since then CARDOX has installed thousands of successful Systems — has held steadfastly to its never-ending research and engineering program for the continuous betterment of CARDOX fire protection.

As a result, CARDOX' experience and knowledge of low pressure carbon dioxide and its application are unapproached—literally years ahead.

This is the priceless "extra" that comes to you with every CARDOX System.

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Underwriters'  
Laboratories, Inc.  
Manual Systems—1940  
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Factory Mutual  
Laboratories  
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Automatic Systems—1942

First Installation—1939  
Thousands of Systems  
since, for most of the  
nation's leading corporations  
and industries.

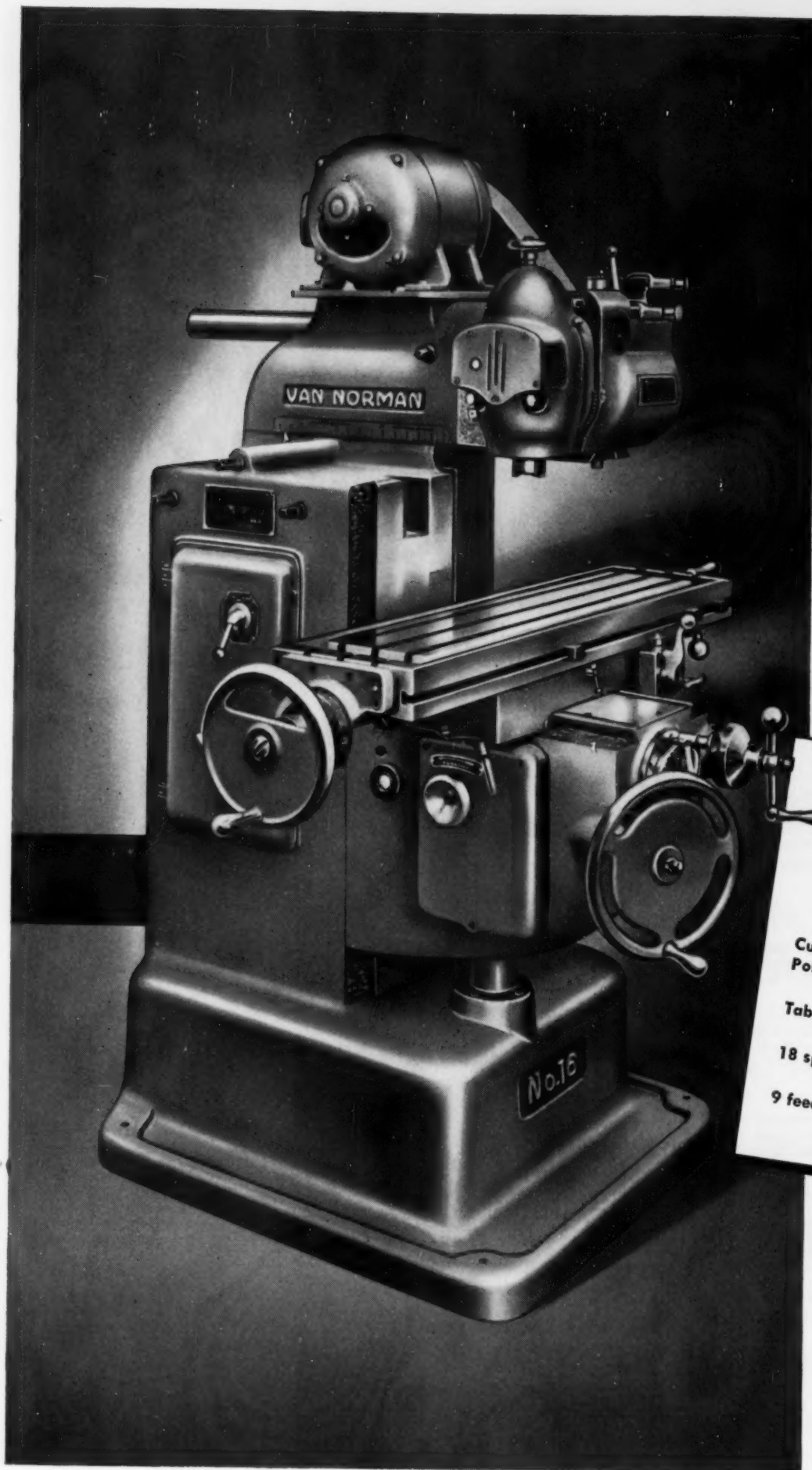
\* Covered by U. S. and  
foreign patents, issued  
and pending.

## CARDOX CORPORATION

BELL BUILDING • CHICAGO 1, ILLINOIS • District Offices in Principal Cities

April 9, 1953

13



## SPECIFICATION

### No. 16

Ram Type Miller

Cutterhead in Vertical Position

Table: 37" x 9½"

18 speeds: 50 to 2000 RPM

9 feeds: 0.6 to 16 in. PM

## THE IRON AGE Newsfront

**SLOWDOWN IN AUTOMOTIVE PRODUCTION** during the second half of 1953 is being predicted by some market analysts. A drop to the 2 million unit operating rate will bring 1953 production down to 5 million units.

**SONAR HAS PROGRESSED FAR** beyond its first postwar job of locating schools of fish. Now it tells the kind of fish. Identity is possible because of varying characteristics of fish "huddles."

**ELECTRONIC MEMORY MACHINES FOR THE CORNER DRUG STORE** are a future possibility. They could take inventory in a few hours, keep a continuous record of stock on hand. Most problems, except cost, have been solved or are well along toward solution.

**EXCESS PROFITS TAX WILL PROBABLY DIE** June 30. Great majority of congressmen feel they must live up to some campaign promises and not extend the tax. Administration would have to use extreme pressure to overcome political aspects of a new tax bill.

**SMALLER RADIOS AND TELEVISIONS** will be one result of guided missile development. Producers of electronic instruments are being forced to cut drastically the size of the units they produce. One example is miniature tube development. Commercial application may come within the next year or two.

**PRINTED ELECTRICAL CIRCUITS** are due for wider use. Cost problems are nearer to solution. Some radios already use the printed circuits. Circuits resist vibration, are simple to assemble, eliminate loose wires, save copper.

**NONCRITICAL METALS**, 16 pct aluminum and 84 pct iron, make up 16-Afenol, the "soft" magnetic material the Naval Ordnance Laboratory has worked out. Superior magnetic properties will make the alloy useful in transformer cores, high-frequency communications instruments.

**TOUGH COMPETITIVE SLEDDING, WITH PRICE CUTTING**, faces the soft coal industry during the next several years. More mines will be shut down, fewer new mines developed. Competition from other fuels will grow more acute. Lower-priced coal from non-union mines is hurting union-organized operations.

**EUROPEAN EXPORTERS OF STEEL** ARE GIVING plenty of thought to their own steel price structures. They foresee huge increase in year-end supplies of American steel as large segments of new mill capacity go into operation. Pressure of supply would force revisions.

**PRESSURE IS GROWING** for complete review and modernization of Federal tax laws. Next spring is unofficial goal of some key legislators. Double taxation and tax ceilings are some of the knotty problems that will get attention.

**CUSHIONING COSTS HAVE BEEN CUT** with development of cushioning material derived from latex foam and scrap. Cellular rubber cushioning scrap is ground and coated with a rubber binder, cured in molds for shape. Material has the properties of straight latex foam at lower cost.

# New, FORD Foundry Speeds Handling of-

**SAND, PIG IRON,  
SCRAP, SLUDGE**

with

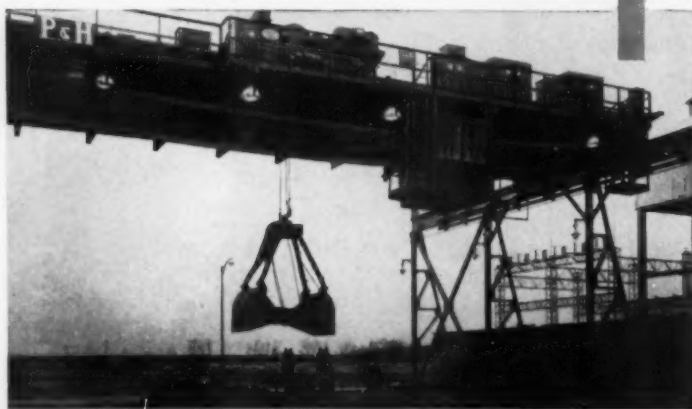


## MAGNETS and CRANE CONTROL

THESE CRANES AT THE NEW, MODERN  
FORD FOUNDRY IN CLEVELAND ARE  
EQUIPPED FOR —

1. *Speed Control* with EC&M Cam Type Master Switches—Bulletin 1190.
2. *Smooth Starts and Stops* by EC&M Frequency Relay Controllers—Bulletin 930.
3. *Long-life Brake Operation* through EC&M Type WB Brakes—Bulletin 1006.
4. *Safety* with EC&M Manual-Magnetic Disconnect Switch—Bulletin 1024.

Also on the magnet cranes, EC&M Bulletin 900 ALL-WELDED Lifting Magnets and EC&M Bulletin 905 Automatic-Discharge Controllers speed scrap and pig iron handling at low cost.



For overhead foundry cranes, EC&M Magnets and EC&M Crane Control

have earned a reputation for fast, safe handling of materials in all stages of production. Designed for highly repetitive operation, EC&M equipment gives "main-line, non-stop" service which, users know, results in quicker handling and lower cost per operation. When buying cranes, make it a point to specify EC&M Control and EC&M Magnets.

**THE ELECTRIC CONTROLLER & MFG. CO.**  
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



# ALLOYS: Conserve Now—Be Safe in War

**Hot war means war of special steels, alloys for rougher heat and strength uses . . . On some war alloys we're in danger . . . What is being done in future planning—By T. Metaxas.**

"Hot war" has a double meaning. It also means a war of specialized steels and alloys that can stand up to inferno temperatures of hotter jet engines, hotter guns, and armor to withstand deadlier shellfire.

Without such alloys as cobalt, columbium, nickel, molybdenum, tungsten, vanadium, manganese, chrome, jet engine parts would melt and gun barrels would warp.

We need these metals to make our jets, tanks, ships, electronic equipment, engineering steels, marine non-magnetic steels, tungsten carbide shell cores, carbide cutting tool tips and dies to fabricate military steel, our trucks and cables. Without them we would have a soft metal military machine unsuitable to an improving war technology.

## Five Stay Critical

We have managed to relieve many materials shortages and we have achieved fair supplies on some alloys. But five are still getting special attention under Munitions Board's Spot Materials Conservation Program. On cobalt, columbium, nickel, molybdenum, and tungsten we are said to be in long-term danger. For at least two others, beryllium and tantalum, a serious situation also prevails.

In today's quasi-war period the Army, Navy and Air Force are sparring with the enemy in a technological competition which has made the military the foremost user of special steels and alloys. It knows its alloy needs can never diminish—but must increase as armaments evolve into more modern types.

At best only a fraction of the alloys we use can be dug on this continent. Should war come they must be hauled here in sitting-duck freighters. In war our alloy needs might suddenly double—and deficits in supply (certain for some) could even regulate the number of planes, tanks, guns we could make.

For this reason Washington has erected precautions against future alloy shortages by stockpiling, investing millions of dollars in developing overseas mines—and most important has set up a military program that plans against shortages by learning to live with them now. Since the military will be the prime consumer, it is tailoring its present and future needs as if war would hit tomorrow.

Statistics on alloy production are disconcerting to the military man. One of his alloys for "hot" and "tough" applications (jets and armor) is cobalt—and he

knows that 90 pct of our needs must be imported, principally from the Belgian Congo.

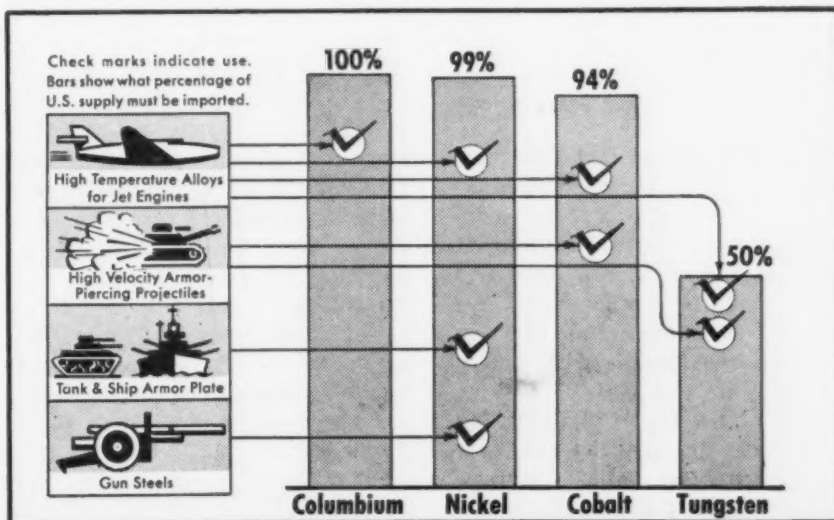
Significant is the fact that in 1947 use of metallic cobalt was but 2.5 million lb while in 1951 it had risen to 8.5 million lb. Even more significant is that in 1947 only about 1 million lb went into cast cobalt-chromium-tungsten-moly alloys but in 1951 almost 5 million lb went for the same purpose, indicating much heavier military use.

We can only import a fraction of our needs for another "hot" alloy, columbium, which is freighted here from Nigeria. Not so long ago metallurgists were entranced by columbium's heat resistant properties but today they research to abandon the metal for one less critical.

Fortunately America owns about 95 pct of world molybdenum reserves but unfortunately we can use more in a crisis. As moly monopolists we are committed to supplying our Free World friends for their defense.

Naturally Russia withdrew her supplies of chromite and manga-

## How Much We Import, Where It Goes



nese and while we must import 90 pct of our manganese and 100 pct of our chrome we have built up distant sources to tighten the slack. Red China dropped us as a tungsten customer but we managed to boost domestic supply and reactivate South Korean mines. For *present* demand, tungsten supply is described as adequate.

Arriving mainly from closeby Canada, nickel (99 pct of our needs) will remain a critical metal for as long as jets and tanks are made.

In projecting demand to year 1975, the President's Materials Policy Commission estimates that use of nickel and chromium will double, tungsten and moly will rise 150 and 170 pct respectively, cobalt will more than triple. Yet this is said to be the "normal" rise. All-out war could lop decades off the projection.

### Harsh Preparatory Measures

Holding mediocre cards in a desperate game, the military has been forced into harsh measures of preparation. Conservation may have begun as strictly a budget economy measure after World War II, but now its broad aim is to slice requirements for strategic materials and to plan or redesign a military machine that can be sustained in an all-out conflict.

There has been some carping over Defense Dept.'s stand that conservation is not feasible if it sacrifices performance. IRON AGE was told that even at the expense of using that extra pound of cobalt in a jet we must strive for superior equipment to offset huge manpower advantages of our enemies.

One military man told THE IRON AGE, that the peacetime inclination of a designer was to make sure his model would work by putting into it "surplus quality." When performance is equal, the military is discouraging this by choosing the design with fewer critical materials.

While designing is planning for the future, the services are posting spectacular alloy savings through substitution and use of

alternates. Before World War II armor plate contained 3 pct nickel. Had it not been for the intrusion of the jet plane this might have continued to be comfortably possible. But the pattern has been scrambled by new weapons and evolution of old ones. Now designers are trying to distribute alloy supplies in pace with new needs. What is happening in armor plate is the drastic reduc-

### How to Design For Military

When a military designer sits down at his drawing board he has six thoughts hardened in his mind: (1) He must plan equipment that will have to be produced amid certain shortages of real war. (2) At no sacrifice of performance, he must lower requirements of critical materials. (3) He must first consider a low alloy steel before advancing to a higher grade. (4) To give manufacturers crisis leeway, he must provide for use of alternate or substitute materials. (5) He must achieve the utmost in simplification, shy from ornaments or frills, extra surfaces or machining even if they are standard commercial practice. (6) To avoid waste, higher costs, he must try to hold to recognized commercial specifications.

tion of alloy requirements while performance improves.

During the second half of last year the Army reported saving 3.5 million lb of nickel—and of this, 2.5 million lb was through reduction of nickel in cast and rolled armor plate and 0.5 million lb by switching from 400 stainless to 300. When the Society of Automotive Engineers rerated alloy steels in truck parts to get equivalent performances with alternate grades using fewer critical alloys, another important saving was registered.

For 1952 the Navy reported saving 3.5 million lb of nickel, and points to lower alloy use in steels for gun mounts, rapid fire guns, diesel engines.

Manufacturers of jet engines have had some success in switch-

ing from cobalt base alloys to nickel base. Although substitution of one critical alloy for another may seem paradoxical, the aim is to shift dependence to the less critical. Wartime supply of nickel may be 10 or 15 times that of cobalt.

Meanwhile the Army is conducting extensive tests of boron steels and the Navy and Air Force are thinking in terms of plastics for applications where weight or salt water corrosion are important.

Guiding all conservation measures is research, being conducted by the military services on two fronts—one to develop superior weapons and one to find less critical materials to produce these weapons in volume when needed.

Getting furious attention is the search for suitable ceramics to coat metals and give them staying power under heat and marine corrosion. The Navy is investigating ceramic-coated metals for submarine equipment, for ship exhaust piping and mufflers. Ceramic-coated aluminum has been considered. Plastic pipes are in the innards of two destroyers.

### Heat-Resistant Jackets

Products of research are titanium carbide frit (coating) for jet engine parts, ceramic-coated jet engine combustion liners and inner combustion chambers. Purpose of the ceramic coat is not only to reduce alloy content of present metals but to outfit them with jackets to withstand even hotter jet thrusts. IRON AGE was told a greater part of the coating industry may soon be enlisted to process aircraft engine hot gas parts on a production basis.

By coating some of the lighter metals with ceramics and thus raising their relatively low melting points, the military will make a larger attempt to take advantage of their light weights and non-magnetic qualities.

Scientists are on a number of projects concerned with development of cermets or ceramic-metal compositions for jet engines. One project is devoted to electric resistance sintering of powders—or

## ECONOMICS: Foremen Get Diplomas

**Youngstown Sheet & Tube teaches free enterprise facts of life to its foremen . . . Graduates show fast rise in knowledge after 14-week course . . . Pupils want more—By R. M. Lorz.**

short time applications of very high temperatures and pressures on cermets.

With tougher demands being imposed on war equipment, research has also trended to tougher steels, better casting techniques.

While the military conserved, other government agencies have rushed dollars overseas to develop sources of strategic materials. Defense Materials Procurement Agency has awarded long-term contracts to foreign ore producers.

### Loans Millions for Mines

The Export-Import Bank has loaned millions to develop mines. The State Dept. has smoothed the way for raw materials negotiations, and Marshall Plan money and equipment have helped out. At home Defense Minerals Exploration Agency financed minerals prospecting while the Bureau of Mines pondered ways to process lean U. S. ores without raising costs prohibitively.

DMPA has contracts all over the earth for future production of cadmium, chromite, cobalt, columbite-tantalum, manganese, moly, nickel, tungsten. Export-Import Bank loans have oiled overseas metals sources. About \$265 million of its funds have since June 1950 gone to finance output of cobalt, manganese, nickel, tungsten, and several other metals.

Most of this money will yield shipments for America.

Always nagging the military man is the worry of guided missile warfare. With jet engine needs seen as growing and guided missiles to be put into mass production as soon as designs can be frozen, these two fiery-tailed implements of modern war are in a position to consume a good part of available alloys.

Even our best laid estimates of military alloy needs can be led astray by a sudden and violent need for guided missiles. Military men fear that a better choice may have to be made: Will we have to channel alloys away from one piece of equipment to make more of another?

In a few weeks they will be handing out diplomas to about 1100 veteran steelmakers at Youngstown Sheet & Tube Co. The "pupils"—all foremen in the firm's Valley and Chicago plants—went back to school last Jan. 5 to find out what makes the American economic system tick.

How can America, with only 6 pct of the world's population and resources, produce half of the manufactured goods used in every corner of the earth? How much does the average steel worker actually know about where his company's money goes? Is money the sole answer to security?

These questions were undoubtedly considered most prominent by retiring Board Chairman Frank Purnell when he decided to make the answers available to his men.

### Test Economic Knowledge

Instead of guessing how much his men knew, Mr. Purnell called in the Opinion Research Corp., of Princeton, N. J., to gage management's knowledge of basic economics with the National Standard 61 Question Economics Test.

Results showed most supervisors had a somewhat sketchy idea of free enterprise as it applied to their efforts. In a pilot group of 300 department heads and general foremen, average scores on the economics test ranged from 61 for foremen to 81 for department

heads. There was apparently plenty of room for training since men on the executive level usually score an average grade of 91 when taking the same test.

To get the ball rolling Sheet & Tube put Economist Thomas Dimond in charge of economic training. Mr. Dimond working with the University of Chicago set up a 14-week training program, covering the same ground as most elementary college courses. In addition to the basic facts, Mr. Dimond and his staff of three experienced teachers also instruct the men in accounting principles and company operations.

### Down-to-Earth Course

Students spend 2 hours a week at Youngstown's Buckeye School, studying everything from personal economics to government and free enterprise. It sounds like a tough assignment but the course is presented in down-to-earth terms for the benefit of men who haven't had extensive formal education.

Success of the program can be measured by test results recorded after the pilot group completed the training program. (See box.)

Results were obtained by supplementing textbook material and class instruction with interest-getting techniques. With the 450 visual teaching aids and lively class discussions, actual case histories were studied.

The steel industry and America's booming television business were both put under the class microscope. Mr. Dimond and his teaching staff feel the case history approach is one of the best ways to analyze production, capital investment, competitive prices and other aspects of corporation economics.

What do the men think of the training program? Their answer is—"give us more." Youngstown Sheet & Tube and many other basic producers plan to do just that.

### Tests Show Training Takes

	Before	After
Youngstown Dept. Heads & Assistants . . . . .	81	90
Chicago Dept. Heads & Assistants . . . . .	85	91
Youngstown General Foremen . . . . .	66	86
Line Foreman . . . . .	61	*

\* None in pilot group.

## INDUSTRY: Pessimism Goes Unheeded

**Expansion in Midwest continues with no cutbacks . . . Roster of firms that are growing, diversifying . . . Titanium plant in Tennessee . . . Structural backlogs high—By K. W. Bennett.**

If there are pessimists warning of danger to the American economy, Midwest industry is ignoring them. The expansion spirit is carrying forward into 1953. Interviews with leading executives indicate that important first quarter expansion plans are not being curbed. Crane Co., at Chicago, announced that it would soon finalize plans for a Tennessee titanium plant. Indicated output would dwarf most titanium production to date. Lindberg Heat Treating in the Chicago area was beginning work on what will be the Midwest's largest heat treating plant.

### Who Is Expanding

Steel distributors like Ryerson, U. S. Steel Supply, and A. M. Castle were putting the finishing touches on early year expansion. Vapor Heating broke ground for a \$2 million plant. A representative cross-section of expansion in the Midwest would read: Bliss & Laughlin, Globe Oil, Warwick Mfg. Corp., Cardox Corp., Barrett-Cravens, International Harvester, Autogas, Zenith, Inland Steel Products, Standard Oil of Indiana, Hotpoint, Buda, Fairbanks - Morse (factory well underway, another projected).

And Onsrud Machine Works, Doall, American Can Co., Motorola, Caterpillar Tractor, American Steel Foundry, International Rolling Mill Products, and others.

All above are metalworking firms and represent a fair slice of the industry. The list includes appliances, containers, materials handling, construction equipment, heat treating, cold-finishing, warehousing, automotive parts, electronics, industrial pumps.

Suppliers of structural steel indicate they will be booked solidly through third quarter, and fabricators are reporting backlogs of 6 and 8 months. Despite early first quarter price cutting among small-

er structural fabricating firms, it was expected that prices would firm up because backlogs were swelling up again.

A representative group of small fabricators reports an existing backlog for 1953 that equals two-thirds of the total work handled during 1952.

### Looking for Trouble?

Two trouble spots are apparent to trouble seekers: bookings across the nation for fabricated structural steel fell from 271,077 tons in January to 182,184 tons in February. An answer is that total work shipped was 2,664,255 tons. Backlog for 1953 completion is 2,128,389 tons. It will take a passel of cancellations to wipe out the work load.

Warning sign No. 2: In the Chicago area, traditionally a stronghold of highly diversified industry, new reported industrial starts fell from 20,441,000 in February 1953 to 6,612,000 in March. An answer: At the conclusion of the first quarter, work in progress will still exceed first quarter 1952 by about \$5,000,000, or \$44,960,000 in first quarter 1953 as opposed to \$39,-

822,000 in first quarter 1952. A further check in the area indicates a total of 117 new plant starts in the same area in 1952, a year exceeded only by 1951 and 1946. The tabulator, a power distribution company, reports first quarter starts this year match the same period in 1952.

### Commerce Shows Dropoff

Dept. of Commerce estimates reflect a 4 pct dropoff nationally in new manufacturing facilities in 1953 as compared with 1952. The same source reported 11,130 new starts nationally in 1951, about 12,452 in 1952, and estimates 11,907 for 1953, or 4 pct less than 1952 but still 10.7 in excess of the 1951 figure.

A fat portion of new construction represents diversification, as reflected in the titanium plant reported above. Increased use of magnesium, aluminum, plastics, and titanium are indicated. Steel expansion of finishing facilities, not covered here, is moving strongly. Complete new product lines, such as air conditioning new appliances, power units, and controls, are indicated.

The new expansions are of healthy size. Public relations men speak fondly of, "The world's largest installation of its type."

### Build Sintering Plant at Nicaro

Work is to start shortly on a sintering plant for the Nicaro Nickel Co. works in Cuba. The new plant is expected to begin turning out nickel oxide pellets by the end of 1953.

It will cost the government about \$750,000 for installation of the equipment by Frederick A. Snare Corp., New York, the firm which built the original plant and reconditioned it last year.

General Services Administration estimates that the cost will be quickly liquidated since the sintered product is expected to bring 2¢ a lb more than powdered oxide.

Sintering method to be used was developed by Nickel Processing Corp., operators of the plant. It produces a product more usable by the steel industry, GSA says.



"Well, I guess we'll have to try something else."



ACCURACY in firing depends on accuracy of production. Here shells are inspected.



EXPANDING section of cold-drawn tubing in a 125-ton press.

## Giving Punch to Mortar Shells

Combat reports from Korea stress the faultiness of Red mortar shells and the high quality of ours. Accuracy of American shells is no accident.

Particularly potent are the 4.2-in. shells—largest U. S. mortar projectiles. One of the largest producers is Lehigh Foundries, Inc., Easton, Pa., which produced 25 million of these jumbo shells during World War II, winning four Army-Navy "E" awards. Now Lehigh is turning out thousands of rounds daily for Korea.

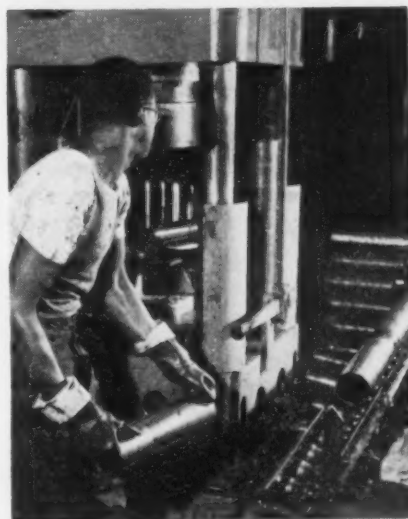
Lehigh starts its production cycle with seamless cold drawn mechanical tubing from Pittsburgh Steel Co. The high-carbon, high-manganese tubing is first cut to length, then sized on 125-ton hydraulic presses.

Twenty-four carbide rings on a tapered reamer are pushed

through the tubing to remove imperfections, smooth and polish the inside surface, and correct ovality to exact diameter. In this step, the tubing is expanded slightly to a tolerance of less than 0.015 in.

After reaming, shells go to a 150-ton nosing press where the tubing nose is tapered to produce an ogive (curved portion of shell body) with close tolerance concentricity. The nose is then brazed into position and machined.

After the base plate has been positioned, the shell is carefully sized and inspected. Final operation is cleaning, bonderizing and painting to protect against corrosion.



COLD NOSING tubing to form radius on ogive in a 150-ton press.



MORE INSPECTION to assure hits on the battlefield.



CONVEYER carries the 4.2 in. mortar shells on their way out of plant.

# Fort Pitt Bridge

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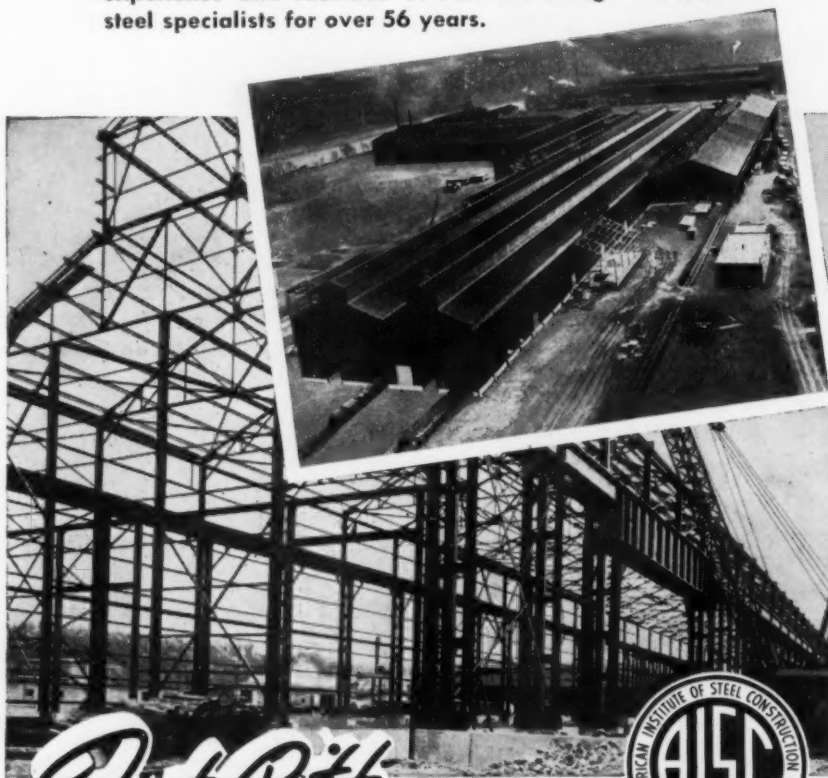
## STEEL MILL BUILDINGS

For the Leaders in the Steel Industry

Allegheny Ludlum Steel Corp.  
Armco Steel Corporation  
A. M. Byers Company  
The Colorado Fuel and Iron Corporation  
Columbia Steel & Shafting Co.  
Copperweld Steel Co.  
Crucible Steel Co. of America  
Follansbee Steel Corporation  
Great Lakes Steel Corporation  
Jessop Steel Company

Jones & Laughlin Steel Corp.  
National Supply Company  
Pittsburgh Steel Company  
Republic Steel Corporation  
Rotary Electric Steel Company  
Universal-Cyclops Steel Corp.  
Washington Steel Corporation  
Weirton Steel Corporation  
Wheeling Steel Corporation  
Youngstown Sheet & Tube Co.

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Endurance and Economy



### Labor

## STRIKE:

**Trainmen's walkout cost U. S. Steel 125,000 ingot tons.**

Significance of the labor dispute that paralyzed four Pittsburgh District plants of U. S. Steel Corp. last week is that a handful of employees in key positions can seriously hurt steel production.

Directly involved in the strike were 1500 employees of the Union R. R., which serves district operations of the steel company, bringing in materials from railroad main lines and transferring finished and semi-finished steel within the mill gates.

### What It Cost

Result of the strike: An ingot loss of 125,000 tons at a time when consumers are screaming for material, loss of 90,000 tons of coal production from U. S. Steel mines, furloughing of 40,000 production workers and miners, loss of \$2.5 million in wages.

Strike was caused by the disciplining of two railroad workers for an alleged slowdown on the road. Settlement included an admission by rail union leaders that a slowdown existed and that the company was justified in the disciplinary action. The union agreed to cooperate in preventing recurrence of slowdowns.

Coming on top of U. S. Steel's shutdown of No. 3 openhearth shop at its Homestead Works, the strike was a hard blow to the company's customers. Some of them made anxious calls trying to determine how long the walkout would continue and how they would be affected. The Homestead shutdown followed an inspection indicating unsafe conditions in the plant. It will continue pending a detailed inspection expected to show extent of repairs needed. Shop capacity is 1.06 million tons per year.

U. S. Steel also announced Monday that it was shutting down six openhearth furnaces at its Duquesne works for 2 to 3 weeks for building repairs. The furnaces produce 1300 ingot tons per day.

# ENGINEERS: Women Are Missing

**Largest possible source of new engineers not developed . . . Schools, parents and industry responsible . . . Only 52 received engineering degrees last year—By E. C. Kellogg.**

To the young engineer finishing his senior year at college, the business world must seem like a combination of prom week, a new blonde and free beer. For maintaining "gentlemen's grades" he is courted with offers of \$345 per month to start.

Battling an engineering shortage ever since the start of World War II, industrial firms have gone to such extremes as offering to hire entire graduating classes sight unseen.

Despite its thorough canvass of the nation's campuses in an attempt to find the 30,000 new engineers needed each year, industry has done almost nothing to develop what could be the largest single source of new engineering talent—women.

## Give No Encouragement

Though the engineering scarcity has forced even the most hide-bound companies to drop whatever prejudices they may have against hiring women engineers, the number that are available has been so pitifully small that this source has not eased the supply-demand problem in the slightest.

## High School Is Crux

Out of a graduating class of about 105,000 women last year, only 52 had engineering degrees. The reason there were so few is because parents, teachers, guidance counsellors and industry did nothing at the high school level to promote the idea that engineering could be an attractive career for girls.

Educators and parents are in the best position to make girls aware that slide rules are not the restricted property of males, but industry can also do much.

It has been estimated that America, in addition to needing 30,000 new engineers each year,

also has a backlog of about 40,000 unfilled jobs for experienced engineers.

U. S. Office of Education's tabulation on the number of engineers that will be available on graduation from 1952 through 1956 shows that last year's total of 23,900 was the high point for the period. The most critical year will be 1955, when there will be only 10,000 engineers ready to accept jobs.

Of the more than 100,000 women graduating from college each year, no estimate can be made on the number that would have become engineers had they been encouraged when entering high school.

## Ratio Is Poor

But the comparative ratio of women to men in other professions gives some indication. In law and medicine, there are 30 to 40 women for every 1000 men. For engineering the proportion is three per 1000.

There has been no organized plot to keep women out of engineering. With few exceptions, no coeducational college bars women from taking engineering,



"Who said anything about wanting proper light or correct time—this design is basic."

and industry does not have a double standard on salaries, at least at the starting level.

Main obstacle is the negative influences exerted at the secondary school stage. Most parents and teachers never think of suggesting engineering as a career for a girl, even though she may have shown outstanding mathematical, scientific or mechanical aptitudes.

If a girl does happen to inquire about engineering on her own, she is usually told that it's a man's job and consists of bossing construction gangs or slashing through jungles in the Amazon.

## Industry Can Help

How can industry help make engineering more appealing to women? THE IRON AGE learned that one of the most effective methods is to have committees of engineers employed in local industries work with guidance counsellors in the high schools.

These groups can explain that many engineering jobs consist solely of deskwork, that there are opportunities for women, particularly in research, development and design, that women can expect the same salaries as men, and that some firms and foundations offer engineering scholarships to both men and women.

Industry can also make engineering more attractive to women by giving proper recognition and advancement to those already employed in the field and by assuring them that they will not be laid off if they get married.

## More Talent Available

Not only will promotion of engineering as a career for women help fill industry's demand, it will also make available more talented engineers.

Industry is already scraping the bottom of the barrel to get male engineers, but since the vast majority of college women have never even been screened for engineering talent, it is apparent that many more than the current number of 1500 could be employed before the marginal level was reached.

## STEEL: Strike Cut Profits 22 Pct

**Iron Age Financial Analysis shows labor trouble slashed production, earnings . . . Federal taxes declined most . . . Need for higher profit margin highlighted—By J. B. Delaney.**

The steel industry's performance during 1952 was marred by the 54-day strike of steelworkers. The walkout hit profits and production. It slowed the industry's expansion program.

A survey by THE IRON AGE indicates that industry earnings are off over 22 pct from 1951, the second straight year that profits showed a decline. Income for 1951 dropped more than 13 pct from the 1950 level.

### Make Strong Comeback

Once the strike was settled, steel producers made a strong comeback, and at year's end production records were toppling like tenpins. Fourth quarter earnings were good despite the small 4.7 pct price increase granted by Office of Price Stabilization to offset the average 25-cent pay boost granted the steel workers. This was due to a record-breaking operating rate of 106 pct of capacity and, partially, to recovery of credit on excess profits tax.

Outlook for 1953 is much brighter. The industry looks for peaceful settlement of wage demands from the United Steel Workers. Demand for virtually all steel products continues strong and is likely to remain so through third quarter. The industry's price picture is much brighter now that controls have been removed. Some upward adjustments are in the works but may be delayed pending settlement of union wage negotiations—an important factor.

### Efficiency Improving

The industry is a more efficient operating machine now that its expansion program is nearing completion. Ingot capacity jumped from 108.5 million tons to 117.5 Jan. 1, 1953. This production is coming from bigger, more efficient furnaces, and finished steel is being rolled on faster, better equipment.

THE IRON AGE study embraced 27 companies representing 92.3 pct of industry capacity as of Jan. 1.

Earnings for these 27 companies last year were \$496.2 million, compared with \$638.5 million the previous year, a decline of 22.3 pct. Of the top 12 producers, rated according to net income for 1952, only one, Kaiser Steel Corp., reported higher earnings over 1951.

a decline of nearly 65 pct in tax revenue. This was ironical in view of the fact that government interference in the labor dispute was perhaps as much of a factor as any other in bringing on the strike and prolonging it. Less than 2 weeks after the walkout began, the USW could have settled for substantially the same economic terms as finally agreed upon. But encouragement from a sympathetic government, plus a willingness to "shoot the works" in an effort to win the closed shop delayed a settlement.

Net income in relation to sales for the 27 producers covered in the survey showed a drop of 15.5 pct.

### The Top Twelve

Net income, in thousands of dollars, of 12 steel companies rated in order of reported 1952 profits, with pct of change from 1951 is as follows:

Company	1952	1951	Pct of Change
U. S. Steel Corp.....	\$143,687	\$184,359	— 22.1
Bethlehem Steel Corp....	90,900	106,531	— 14.7
Republic Steel Corp. ....	44,274	54,921	— 19.4
National Steel Corp. ....	37,559	45,287	— 17.1
Armco Steel Corp. ....	31,337	35,004	— 10.5
Inland Steel Co. ....	23,755	34,398	— 30.9
Youngstown Sheet & Tube Co. ....	22,915	30,644	— 25.2
Jones & Laughlin Steel Corp. ....	19,482	30,998	— 37.2
Wheeling Steel Corp. ....	10,950	17,392	— 37.0
Kaiser Steel Corp. ....	10,399	7,510	+ 38.5
Allegheny Ludlum Steel Corp. ....	5,940	8,834	— 32.8
Colorado Fuel & Iron Corp.	5,761	10,044	— 42.6

Kaiser was not affected by the strike. Declines for the others ranged from 10.5 pct for Armco Steel Corp., only partially affected by the walkout, to 42.6 pct for Colorado Fuel & Iron Corp.

Ingot production for the group was approximately 90 million tons, a drop of 10 pct, while shipments totaled approximately 65 million tons, a decline of 8.5 pct from 1951.

Net sales and operating revenue was slightly more than \$10 billion, compared with over \$11 billion in 1951, a drop of 9.8 pct.

Uncle Sam was even harder hit than the steel companies, suffering

The stockholders didn't fare too badly. Common dividends declared were off only one-half of 1 pct, an indication of industry determination to treat its owners well and thus attract more invested capital. This policy apparently is paying off since there are indications that investors are now looking more kindly on steel stocks.

Funded debt jumped 39 pct during the year, from slightly over \$1 billion to \$1.4 billion. Common stock remained virtually unchanged. Surplus was up 6.4 pct and invested capital rose 8.9 pct. Working capital was off slightly.

# THE IRON AGE Financial Analysis

COMPANY	Year	Ingot Capacity Net Tons	Ingot Production Net Tons	Percent of Capacity Operated	Steel Shipments Net Tons	Net Sales and Operating Revenue	Provision for Federal Income Taxes	Net Income	Net Income Percent of Sales	Number of Common Shares Outstanding	Earnings Per Common Share
U. S. Steel Corp.	1952	36,399,000	29,436,000	85.0	21,133,000	3,137,397,336	117,000,000	143,687,746	4.6	26,109,756	4.8
	1951	34,643,000	34,323,000	101.3	24,626,000	3,524,121,226	398,000,000	184,359,787	5.2	26,109,756	6.1
Bethlehem Steel Corp.	1952	16,800,000	14,116,342	84.0	10,290,587	1,701,541,383	66,000,000	90,900,771	5.3	9,582,942	8.3
	1951	16,000,000	16,405,677	102.5	12,138,732	1,799,506,346	162,000,000	106,531,293	5.9	9,582,942	10.1
Republic Steel Corp.	1952	10,262,000	7,991,238	82.8	6,025,990	918,447,135	42,600,000	44,274,053	4.8	5,902,719	7.1
	1951	9,490,000	9,142,096	102.0	6,993,619	1,052,715,386	117,500,000	54,921,541	5.2	5,896,719	9.1
Jones & Laughlin Steel Corp.	1952	5,900,000	4,710,000	83.0	3,332,000	495,401,000	5,858,000 <sup>2</sup>	19,482,000	3.9	6,200,654	2.1
	1951	4,847,000	5,032,000	104.0	4,000,000	564,330,000	54,339,000	30,998,000	5.5	6,200,654	4.1
National Steel Corp.	1952	5,100,000	.....	.....	.....	548,625,817	42,000,000	37,559,477	6.9	7,362,045	5.1
	1951	4,750,000	.....	.....	.....	618,461,408	95,000,000	45,287,093	7.3	7,362,045	6.1
Youngstown Sheet & Tube Co.	1952	4,947,500	3,937,490	90.1	2,867,500	439,623,183	16,890,000	22,915,822	5.3	3,350,016	6.1
	1951	4,370,000	4,451,854	104.7	3,362,104	489,305,162	38,692,000	30,644,201	6.3	3,350,016	9.1
Armco Steel Corp.	1952	4,718,000	4,042,473	85.7	3,078,639	518,575,218	43,095,226	31,337,861	6.0	5,214,994	6.1
	1951	4,525,000	4,357,562	96.3	3,386,554	534,834,687	69,141,292	35,004,487	6.5	5,214,997	6.1
Inland Steel Co.	1952	3,906,233	3,307,253	84.7	2,820,797	460,451,935	13,117,000	23,755,218	5.2	4,899,380	4.1
	1951	3,750,000	3,837,268	102.3	3,544,432	521,449,655	53,520,000	34,398,585	6.6	4,899,315	7.1
Colorado Fuel & Iron Corp.	1952 <sup>4</sup>	2,024,000	1,892,485	93.5	1,575,987	195,757,164	8,461,500	5,761,965	2.9	2,158,084	2.1
	1951 <sup>4</sup>	1,522,664	1,615,246	106.1	1,708,855	191,444,412	19,274,000 <sup>5</sup>	10,044,728 <sup>3</sup>	5.3 <sup>3</sup>	2,000,523	4.1
Wheeling Steel Corp.	1952	1,860,000	1,464,985	78.8	.....	180,285,277	7,475,000	10,950,780	6.1	1,423,897	6.1
	1951	1,860,000	1,874,236	100.8	.....	229,012,621	33,662,000	17,392,959	7.6	1,423,887	10.1
Sharon Steel Corp.	1952	1,550,000	1,284,170	82.8	930,525	132,376,426	2,750,000	5,120,414	3.9	1,100,000	4.1
	1951	1,550,000	1,600,205	103.2	1,128,433	169,961,946	18,480,000	8,861,187	5.2	1,100,000	8.1
Kaiser Steel Corp.	1952 <sup>4</sup>	1,380,000	1,381,862	100.1	941,108	117,925,049	12,848,440	10,399,306	8.8	3,200,000	2.1
	1951 <sup>4</sup>	1,380,000	1,217,196	101.4	836,972 <sup>5</sup>	100,471,475	6,925,045	7,510,560	7.5	3,200,000	1.1
Crucible Steel Co. of America	1952	1,350,700	.....	.....	.....	180,266,484	5,577,505	5,394,520	3.0	634,985	6.1
	1951	1,198,960	.....	.....	.....	202,868,727	18,099,421	8,363,225	4.1	574,362	11.1
Pittsburgh Steel Co.	1952	1,152,000	971,029	85.3	958,829	130,158,219	4,829,000	5,150,034	4.0	1,182,651	3.1
	1951	1,072,000	1,091,364	101.8	1,140,539	150,462,914	16,071,000	7,331,599	4.9	1,091,915	5.1
Barium Steel Corp.	1952	893,000	690,128	77.3	.....	99,052,028	6,566,295	2,746,050	2.8	2,259,857	1.1
	1951	893,000	627,220	70.2	.....	91,642,638	8,665,674	4,164,177	4.5	2,230,910	1.1
Allegheny Ludlum Steel Corp.	1952	889,200	569,921	64.1	467,838	190,060,165	2,900,000	5,940,324	3.1	1,656,233	3.1
	1951	817,200	817,058	100.0	676,960	229,090,224	20,190,000	8,834,140	3.9	1,627,169	5.1
Granite City Steel Co.	1952	720,000	621,574	86.3	698,767	74,587,639	3,917,000	4,985,954	6.7	1,379,645	3.1
	1951	720,000	746,911	103.7	821,198	86,603,279	7,980,000	5,142,520	5.9	1,278,462	4.1
Lukens Steel Co.	1952	675,000	555,102	82.2	403,771	69,616,358	3,631,165	2,316,791	3.3	317,976	7.1
	1951	675,000	686,083	101.6	541,376	80,546,418	8,805,500	3,549,567	4.4	317,976	11.1
Detroit Steel Corp.	1952	660,000	529,432	80.2	609,437	87,421,483	4,677,235	4,276,666	4.9	2,371,586	1.1
	1951	660,000	644,788	97.7	780,940	113,747,044	21,812,229	10,514,896	9.2	1,185,793	8.1
Alan Wood Steel Co.	1952	625,000	658,449	105.4	473,983	60,479,849	2,475,000	2,251,073	3.7	606,377	3.1
	1951	625,000	623,232	99.7	465,232	58,764,602	4,192,000	2,303,720	3.9	594,107	3.1
Copperweld Steel Co.	1952	618,318	.....	.....	.....	71,642,488	2,373,500	2,304,387	3.2	514,864	4.1
	1951	554,400	.....	.....	.....	76,185,026	5,510,000	2,703,165	3.5	514,864	5.1
Northwestern Steel & Wire Co.	1952 <sup>6</sup>	573,000	313,856	83.9	276,023	36,571,044	936,000 <sup>7</sup>	924,059	2.5	817,825	1.1
	1951 <sup>6</sup>	321,000	338,690	105.5	279,652	42,981,692	3,586,700	2,915,271	6.8	817,825	3.1
McLouth Steel Corp.	1952	550,000	491,726	89.4	.....	.....	9,600,000	4,227,854	.....	951,680	4.1
	1951	420,000	449,478	107.0	.....	.....	11,542,000	5,151,039	.....	951,680	5.1
Rotary Electric Steel Co.	1952	425,000	323,959	76.2	249,259	37,212,183	2,841,000	1,843,064	5.0	290,413	6.1
	1951	425,000	372,146	87.6	279,862	40,993,056	5,015,000	2,482,974	6.1	290,413	8.1
Keystone Steel & Wire Co.	1952	400,000	389,762	97.4	312,068	48,939,590	6,116,648	4,073,232	8.3	1,875,000	2.1
	1951	400,000	323,956	81.0	264,809	44,406,154	6,130,840	4,724,286	10.6	1,875,000	2.1
Laclede Steel Co.	1952	410,000	413,292	100.8	355,630	47,545,026	2,764,000	2,132,746	4.5	206,250	10.1
	1951	410,000	389,662	95.0	360,230	47,657,001	5,075,000	2,797,998	5.9	206,250	13.1
Continental Steel Corp.	1952	394,000	325,138	82.5	244,169	35,716,970	1,880,000	1,477,030	4.1	501,361	2.1
	1951	394,000	363,484	92.3	280,501	39,866,978	4,150,000	1,530,371	3.8	501,361	3.1
GRAND TOTAL	1952	105,181,951	90,000,000 <sup>9</sup>	85.8 <sup>10</sup>	65,000,000 <sup>9</sup>	10,015,676,449	426,532,514	496,189,197	4.9	92,071,190	.....
	1951	98,273,224	99,998,316 <sup>9</sup>	100.9 <sup>10</sup>	71,000,000 <sup>9</sup>	11,101,430,075	1,213,358,701	638,483,369	5.8	90,398,951	.....
Percent change 1952 over 1951		+7.1	-10.0	-15	-8.5	-9.8	-64.8	-22.3	-15.5	+1.9	.....

1. Payable after 1 yr.  
2. Credit reflects \$9,269,000 recovery 1951 EPT.  
3. Restated, reflects add'l Fed. Taxes under Rev. Act 1951.

4. Fiscal yr. ended June 30.  
5. Revised.  
6. Fiscal yr. ended July 31.

7. Excluding cash held for expansion—\$21,840,918 1952, \$19,700,000 in 1951.  
8. Credit reflects recovery 1951 EPT.

# Financial Analysis of the Steel Industry

Company	Net Income	Net Income Percent of Sales	Number of Common Shares Outstanding	Earnings Per Common Share	Common Dividends Declared	Number of Preferred Shares Outstanding	Preferred Dividends Declared	Funded Debt <sup>1</sup>	Preferred Stock
1,000	143,687,746	4.6	26,109,756	4.54	78,329,268	3,602,811	25,219,677	61,007,129	360,281,100
1,000	184,359,787	5.2	26,109,756	6.10	78,329,268	3,602,811	25,219,677	54,879,636	360,281,100
1,000	90,900,771	5.3	9,582,942	8.80	38,331,768	933,887	6,537,209	298,314,000	93,388,700
1,000	106,531,293	5.9	9,582,942	10.43	38,331,768	933,887	6,537,209	220,314,000	93,388,700
1,000	44,274,053	4.8	5,902,719	7.21	23,586,812	282,043	1,692,258	165,681,945	28,204,300
1,000	54,921,541	5.2	5,896,719	9.03	23,586,812	282,043	1,692,258	141,209,110	28,204,300
1,000 <sup>2</sup>	19,482,000	3.9	6,200,654	2.91	11,161,000	293,568	1,468,000	144,652,000	29,357,000
1,000	30,998,000	5.5	6,200,654	4.76	10,711,000	293,568	1,468,000	115,128,000	29,357,000
1,000	37,559,477	6.9	7,362,045	5.10	22,048,928	None	None	55,000,000	None
1,000	45,287,093	7.3	7,362,045	6.15	22,029,986	None	None	40,000,000	None
1,000	22,915,822	5.3	3,350,016	6.84	10,050,048	None	None	93,100,000	None
1,000	30,644,201	6.3	3,350,016	9.15	10,050,048	None	None	52,000,000	None
1,226	31,337,861	6.0	5,214,994	6.01	15,640,669	None	None	80,519,945	None
1,292	35,004,487	6.5	5,214,997	6.69	14,758,593	None	139,570	59,096,995	None
1,000	23,755,218	5.2	4,899,380	4.85	14,697,978	None	None	113,996,500	None
1,000	34,398,585	6.6	4,899,315	7.02	17,147,603	None	None	67,250,000	None
1,500	5,761,965	2.9	2,158,084	2.64	3,118,518	46,941	54,438	48,500,000	2,375,967
1,000 <sup>3</sup>	10,044,728 <sup>3</sup>	5.3 <sup>3</sup>	2,000,523	4.89 <sup>3</sup>	3,151,581	None	265,723	22,337,500	None
1,000	10,950,780	6.1	1,423,897	6.43	4,271,177	357,526	1,787,630	55,024,900	35,752,600
1,000	17,392,959	7.6	1,423,887	10.96	4,270,990	357,526	1,790,723	50,912,900	35,752,600
1,000	5,120,414	3.9	1,100,000	4.65	4,400,000	None	None	7,850,000	None
1,000	8,861,187	5.2	1,100,000	8.06	3,414,657	None	None	8,850,000	None
1,440	10,399,306	8.8	3,200,000	2.52	800,000	1,600,000	2,330,452	113,126,851	40,000,000
1,045	7,510,560	7.5	3,200,000	1.86	None	1,600,000	1,752,000	85,000,000	40,000,000
1,505	5,394,520	3.0	634,985	6.13	10% stk. div.	298,406	1,492,030	41,637,000	29,840,600
1,421	8,363,225	4.1	574,362	11.89	16% stk. div.	305,272	1,526,360	26,405,000	30,527,200
1,000	5,150,034	4.0	1,182,651	3.25	2% stk. div. <sup>13</sup>	241,943	1,307,373	28,437,668	24,194,300
1,000	7,331,599	4.9	1,091,915	5.99	2% stk. div. <sup>13</sup>	241,943	3,065,327	9,287,989	24,194,300
1,295	2,746,050	2.8	2,259,857	1.22	1,123,108	None	None	None	None
1,674	4,164,177	4.5	2,230,910	1.87	892,364	None	None	None	None
1,000	5,940,324	3.1	1,656,233	3.37	3,386,150 <sup>12</sup>	81,346	355,894	30,860,000	8,134,600
1,000	8,834,140	3.9	1,627,169	5.40	4,067,920	81,346	42,958	22,170,000	8,134,600
1,000	4,985,954	6.7	1,379,645	3.17	1,471,005	121,376	620,506	28,009,375	12,137,600
1,000	5,142,520	5.9	1,278,462	4.02	2,656,014	102,265	None	12,003,125	10,226,500
1,165	2,316,791	3.3	317,976	7.29	1,271,904	None	None	5,417,000	None
1,500	3,549,567	4.4	317,976	11.16	1,271,904	None	None	1,955,000	None
1,235	4,276,666	4.9	2,371,586	1.80	2,371,586	None	None	23,925,876	None
1,229	10,514,896	9.2	1,185,793	8.87	2,371,586	None	None	13,425,000	None
1,000	2,251,073	3.7	606,377	3.17	843,194	65,250	326,250	4,357,000	6,525,000
1,000	2,303,720	3.9	594,107	3.32	820,573	65,813	329,062	4,982,000	6,525,000
1,500	2,304,387	3.2	514,864	4.38	1,029,728	19,720	51,339	7,107,668	4,486,000
1,000	2,703,165	3.5	514,864	5.14	1,184,187	21,300	54,470	1,638,000	1,065,000
1,000 <sup>4</sup>	924,059	2.5	817,825	1.13	None	None	None	None	None
1,700	2,915,271	6.8	817,825	3.56	None	None	None	None	None
1,000	4,227,854	.....	951,680	4.44	None	None	None	11,250,000	None
1,000	5,151,039	.....	951,680	5.41	None	None	None	11,593,779	None
1,000	1,843,064	5.0	290,413	6.35	871,239	None	None	1,000,000	None
1,000	2,482,974	6.1	290,413	8.55	645,958 <sup>14</sup>	None	None	1,500,000	None
1,648	4,073,232	8.3	1,875,000	2.17	3,000,000	None	None	None	None
1,840	4,724,286	10.6	1,875,000	2.52	3,000,000	None	None	None	None
1,000	2,132,746	4.5	206,250	10.34	928,125	None	None	1,758,546	None
1,000	2,797,998	5.9	206,250	13.57	1,072,500	None	None	1,902,542	None
1,000	1,477,030	4.1	501,361	2.94	852,314	None	None	3,000,000	None
1,000	1,530,371	3.8	501,361	3.05	1,027,790	None	None	None	None
1,514	496,189,197	4.9	92,071,190	.....	243,584,519	7,944,817	43,243,056	1,423,533,403	674,677,767
1,701	638,483,369	5.8	90,398,951	.....	244,793,102	7,887,774	43,883,337	1,023,840,576	667,656,300
1.8	-22.3	-15.5	+1.9	.....	-0.5	+0.7	-1.5	+39.0	+1.1

7. Excluding cash held for expansion—\$21,830,918 in 1952. \$19,700,000 in 1951.  
8. Credit reflects recovery 1951 EPT.

9. Estimated, based on national operating rate.  
10. National rate for industry by AISI.  
11. Negative.

# Industry, 1952-1951

DATA COVER OPERATIONS OF 27 COMPANIES  
REPRESENTING 92.3 PCT OF THE INGOT CAPACI-  
TY OF THE UNITED STATES AS OF JAN. 1, 1953

Preferred Stock	Common Stock	Surplus	Invested Capital	Working Capital	Net Income Percent of Invest- ment	Year	COMPANY
360,281,100	870,325,200	905,511,345	2,197,124,774	326,555,376	6.6	1952	U. S. Steel Corp.
360,281,100	870,325,200	865,372,544	2,150,858,480	334,917,584	8.7	1951	
93,388,700	303,459,830	522,795,196	1,217,957,726	499,680,723	8.1	1952	Bethlehem Steel Corp.
93,388,700	303,459,830	476,763,402	1,093,925,932	464,368,175	10.3	1951	
28,204,300	136,060,726	276,432,402	606,379,373	155,190,100	8.0	1952	Republic Steel Corp.
28,204,300	135,979,066	257,437,419	562,829,895	164,281,577	10.3	1951	
29,357,000	62,007,000	263,580,000	499,596,000	93,461,000	4.7	1952	Jones & Laughlin Steel Corp.
29,357,000	62,007,000	256,727,000	463,219,000	93,547,000	7.3	1951	
None	73,620,450	256,876,254	385,035,319	145,121,069	10.1	1952	National Steel Corp.
None	73,620,450	241,365,705	354,558,375	158,825,552	13.1	1951	
None	105,088,053	201,627,920	399,815,973	170,787,553	6.6	1952	Youngstown Sheet & Tube Co.
None	105,088,053	188,762,146	345,850,199	177,313,571	9.8	1951	
None	52,149,936	243,238,329	375,908,210	123,973,720	9.0	1952	Armco Steel Corp.
None	52,149,966	227,541,137	338,788,098	119,013,307	10.9	1951	
None	62,502,746	170,189,501	346,688,747	148,395,528	7.8	1952	Inland Steel Co.
None	62,500,000	161,132,261	290,882,261	112,393,090	12.5	1951	
2,375,967	10,791,021	70,571,067	133,738,055	31,514,332	5.8	1952 <sup>1</sup>	Colorado Fuel & Iron Corp.
None	10,003,216	64,204,072 <sup>3</sup>	97,044,788	29,885,174	11.1 <sup>3</sup>	1951 <sup>4</sup>	
35,752,600	37,021,322	73,908,665	201,707,487	76,312,048	6.4	1952	Wheeling Steel Corp.
35,752,600	37,021,322	69,016,692	192,703,514	78,764,698	9.9	1951	
None	11,060,390	49,106,450	68,016,840	35,916,807	7.9	1952	Sharon Steel Corp.
None	11,060,390	48,386,036	68,296,426	38,267,953	13.4	1951	
40,000,000	3,200,000	51,903,231	208,125,843	33,966,961 <sup>7</sup>	6.7	1952	Kaiser Steel Corp.
40,000,000	3,200,000	44,634,377	172,834,377	24,394,882 <sup>7</sup>	6.0	1951	
29,840,600	15,874,644	36,897,933	124,250,177	38,480,807	5.4	1952	Crucible Steel Co. of America
30,527,200	14,359,044	34,384,522	105,675,766	36,256,744	8.8	1951	
24,194,300	11,017,188	40,554,038	104,203,194	27,402,011	5.6	1952	Pittsburgh Steel Co.
24,194,300	8,819,355	38,892,051	81,193,695	32,672,659	9.5	1951	
None	2,259,857	17,328,858	19,588,715	6,731,218	14.0	1952	Barium Steel Corp.
None	2,230,910	16,114,783	18,345,693	6,957,425	22.7	1951	
8,134,600	11,245,174	56,059,279	75,439,053	33,735,831	7.9	1952	Allegheny Ludlum Steel Corp.
8,134,600	10,169,806	54,936,367	73,240,773	35,187,010	12.1	1951	
12,137,600	17,238,068	22,068,390	79,453,433	15,129,121	13.5	1952	Granite City Steel Co.
10,226,500	15,980,775	19,045,970	57,256,370	20,990,450	10.0	1951	
None	3,179,760	21,040,651	29,637,411	14,014,894	7.8	1952	Lukens Steel Co.
None	3,179,760	19,995,764	25,130,524	13,898,036	14.1	1951	
None	2,371,586	33,259,801	35,631,387	6,751,000	14.4	1952	Detroit Steel Corp.
None	1,185,793	32,540,514	32,726,307	14,623,638	33.8	1951	
6,525,000	6,063,770	13,054,196	30,122,666	7,195,560	8.5	1952	Alan Wood Steel Co.
6,525,000	5,941,070	11,765,517	29,481,987	5,005,432	9.1	1951	
4,486,000	2,574,320	15,735,893	22,796,213	13,971,993	9.8	1952	Copperweld Steel Co.
1,065,000	2,574,320	14,780,729	18,420,049	9,612,770	14.3	1951	
None	4,089,125	9,732,827	13,821,952	2,498,247 <sup>11</sup>	6.7	1952 <sup>8</sup>	Northwestern Steel & Wire Co.
None	4,089,125	8,261,712	12,350,837	56,205	23.6	1951 <sup>6</sup>	
None	2,379,200	24,785,896	36,035,896	13,484,583	11.7	1952	McLouth Steel Corp.
None	2,379,200	20,558,042	32,151,821	7,514,082	16.0	1951	
None	2,904,130	10,486,788	14,390,918	4,444,668	13.2	1952	Rotary Electric Steel Co.
None	2,904,130	9,514,963	13,919,093	3,992,315	18.3	1951	
None	2,604,167	19,409,386	22,013,553	7,460,469	18.5	1952	Keystone Steel & Wire Co.
None	2,604,167	18,336,154	20,940,321	7,094,819	22.6	1951	
None	4,125,000	11,469,777	17,353,323	7,631,733	12.7	1952	Laclede Steel Co.
None	4,125,000	10,265,156	16,292,698	7,114,123	17.6	1951	
None	7,018,789	10,092,362	17,111,151	8,806,739	8.6	1952	Continental Steel Corp.
None	7,018,789	9,467,646	16,486,435	5,326,017	9.3	1951	
674,677,767	1,822,231,452	3,427,716,435	7,281,943,389	2,043,617,597	6.8	1952	GRAND TOTAL
667,656,300	1,813,975,737	3,220,202,681	6,685,403,714	2,058,423,083	9.5	1951	
+1.1	+0.5	+6.4	+8.9	-0.7	-28.4		Percent change 1952 over 1951

12. Plus 2 pct. sto. div.  
13. 1952, 4 quarterly; 1951, 1 quarterly.  
14. Plus 20 pct stock dividend.

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## MAGNESIUM: Industry Shows Its Wares

**Hold first international show in Washington . . . Aim is to educate public and industry . . . Many products displayed . . . Production techniques demonstrated—By R. L. Hatschek.**

Main idea of the International Magnesium Exposition held in Washington last week was to familiarize the public and industry with the metal, its extraction, fabrication and production methods, and its final uses.

The big sales campaign is necessary because production of primary magnesium is about 10,000 tons a month while civilian consumption is about 1000 tons and military is about 3000 tons monthly.

### Stockpile Extra Metal

Biggest part of this production is from government-owned plants. The single private commercial producer, Dow Chemical Co., has a capacity of about 2000 tons a month. Huge surplus is going into the strategic stockpile.

Predictions of magnesium consumption by 1975 in the Paley Report were necessarily rather vague because it is difficult to determine in advance the full extent to which technological progress will facilitate use of such a relatively new material.

But an increase to 1 million tons was cited as a possibility. The magnesium industry is vigorously and aggressively trying to assure itself of maximum growth. And this exposition—first of its kind—was another step in the campaign.

### All You Want

Virtually inexhaustible supply of magnesium's main raw material, sea water, assures that it will gain wider acceptance as a substitute for scarcer materials. Its properties have already assured it a place in aviation, aluminum alloying and anodic corrosion protection to name a few.

But magnesium people are

aiming for the bigger volume of everyday home and industrial products.

### Eliminate the Chassis

One of the more striking displays was an auto with an all-magnesium body made by Essex Aero, Ltd., a British firm. Weight of the entire body, which was built in sections and welded together, is only 132 lb. Even the car's fuel tank is fabricated from magnesium, cutting this component's weight by 60 pct.

Mr. R. J. Cross, the car's designer, believes magnesium is the answer to cutting auto weights. He also envisions a car of the future with no chassis at all—incorporating the required rigidity in a magnesium body.

Another interesting automotive exhibit, though hardly destined for the highways, was the Cummins Diesel Special which ran in last

year's Indianapolis 500-mile Memorial Day classic and set a new speed record in the qualifying trials. Extensive use of magnesium and aluminum castings in the engine saved considerable weight in the sleek speedster. Despite the heavier diesel-type engine, total empty weight is only 2100 lb.

Materials handling equipment figured prominently with magnesium's outstanding industrial success story, the dockboard, sharing the stage with a newcomer—a 2000-lb all-magnesium wheeled yard ramp for unloading freight cars and trucks. It will support a 16,000-lb axle load and can be wheeled about by one man.

### Show Consumer Products

"Lift and Compare" was the theme of last fall's Magnesium Assn. meeting. It was continued at the exposition with displays of many household and office items—an 8-ft stepladder weighing a third as much as a wooden one; a portable sewing machine half the usual weight; a featherweight baby bathinette.

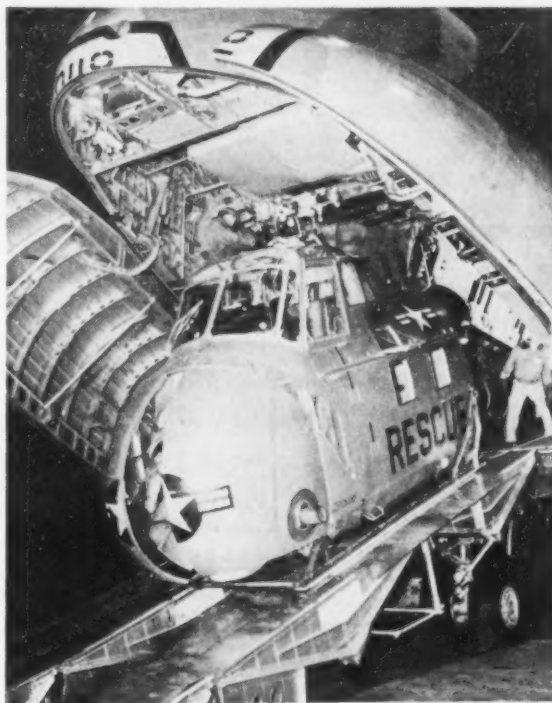
Military items exhibited included all sorts of aviation applications with emphasis on helicopters, radar trailers, electronic equipment, artillery components, ammunition carriers and many other pieces of equipment in which magnesium was used to lighten the load.

### Demonstrate Techniques

Other displays showed how the metal is fabricated.

Welding was shown—and magnesium people are still fighting the idea that the metal is a fire hazard. X-ray testing was demonstrated. Spectators were shown how several chemical and anodic coatings are applied.

Opening day was highlighted by several high-ranking government speakers. One of these was John C. Houston, Jr., Munitions Board vice-chairman for stockpiling, who said government plants could soon be turned over to private industry.



MAGNESIUM IS USED extensively in this Sikorsky S-55 helicopter, shown here being stowed in the hold of a C-124.

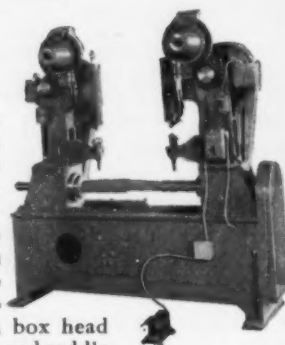
# Speed Production.. Automatically with

## RIVITORS



**T-J RIVITOR** used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.

**DOUBLE RIVITOR** sets two rivets at a time! Equipped with 10" hoppers, and tooled to automatically feed and set two  $\frac{1}{4}$ " diam. x  $\frac{3}{4}$ " long wagon box head rivets at a time in elevator chain and raddle or elevator flight assemblies for farm implements. Controlled by one foot pedal.



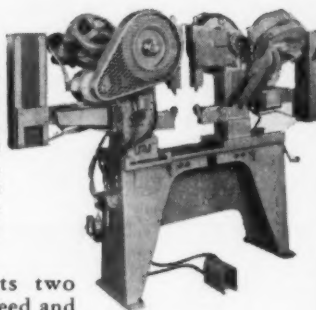
## CLINCHORS



**T-J CLINCHOR** . . . one of six special 8" throat Underfeed Clinchors used by a large automotive body manufacturer.

Feeds and sets  $\frac{11}{16}$ " square cased nuts in outside quarter panels, left and right hand.

**DOUBLE CLINCHOR** sets two nuts at once! Tooled to feed and set  $\frac{3}{8}$ " x  $\frac{1}{2}$ " x  $\frac{1}{16}$ " thick Fabri-Steel nuts at each operation. Both Clinchors tripped by same foot-operated valve. Adaptable to wide range of clinch nut setting problems.



Boost production . . . save labor with T-J Rivitors and Clinchors for many assembly jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds.

**T-J CLINCHORS** set clinch nuts 3 to 5 times faster! Fully automatic . . . controlled by a single foot pedal! Available in Underfeed and Gravity feed models, throat depths 8" to 36".

**T-J RIVITORS** automatically feed and set solid rivets . . . with high production! Electrically-powered Rivitor sets  $\frac{1}{16}$ " to  $\frac{1}{4}$ " diam. solid steel rivets up to  $\frac{7}{8}$ " long. Air-powered Rivitor sets aluminum alloy rivets up to  $\frac{1}{4}$ " diam. or steel rivets up to  $\frac{1}{8}$ " diam. and up to  $\frac{3}{4}$ " long. Throat depths 8" to 36".

Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Co., Jackson, Mich.

37 YEARS EXPERIENCE

**T-J**

**TOMKINS-JOHNSON**

RIVITORS..AIR AND HYDRAULIC CYLINDERS..CUTTERS..CLINCHORS

## Research

### TESTING: Are Policy

**Bureau of Standards chief is sacked, charged with condemning battery additive wrongly.**

Repercussions from the battle of the battery additive may resound through Washington bureaus for months to come. Broader problems are involved than whether the head of the Bureau of Standards was fired for condemning the additive wrongly and whether storage battery life can be prolonged.

Points to be raised in many Washington minds from now on will include these: Should all products submitted for testing get exhaustive tests? Has the government been too high-handed in issuing fraud orders on products? Has small business been getting an even break in product approval?

#### Renews the Ruckus

When Commerce Secretary Sinclair Weeks fired Dr. A. V. Astin as Bureau of Standards chief and gave as a major reason the now famous battery additive AD-X2, the ruckus was renewed. Mr. Weeks' major reason for firing Mr. Astin was that a new product had been condemned without sufficient testing.

As some Washington observers conceded that an Administration man was wanted in the Bureau job and some lever was needed to oust Dr. Astin, a national group of scientists warned that the Bureau should not be made a political football. They pointed up the excellent work it had performed.

The Bureau director counter-attacked before a congressional committee. He said the product had been tested and found to be no different from about 100 others tested over 25 years. All were found valueless, he said.

He said the Air Force had also run a test and had come to the same conclusion—that it had no value.

Offsetting this was a test by Massachusetts Institute of Technology which the Senate Small Business Committee said showed that it did prolong battery life.

## Policy Changes Coming Up?

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These were "limited" tests and not under normal automotive use, it was admitted.

Adding to the uproar was the fact that Secretary Weeks said the Bureau had issued a pamphlet condemning all additives although he could not find where there had been a single complaint.

On the other hand, it was said that there were numerous letters from users which supported laboratory tests indicating that the additive did all that was claimed.

### Revoke Fraud Order

Meanwhile, Bureau opinions had been given to the Federal Trade Commission and the Post Office Dept. The Post Office promptly issued a fraud order and just as promptly revoked it after a conference with Commerce. The FTC withheld its fire.

In addition to new tests for AD-X2, out of this will probably come the following developments:

A new, clear-cut statement of policy by Secretary Weeks concerning the Bureau of Standards and a new director although the Senate Small Business Committee plans to give the ousted Mr. Astin a hearing.

Mr. Weeks points out that indirectly the Bureau has the power to make introduction of a new product very difficult, a matter of particular importance to small business which doesn't have the finances to fight back. Congress is particularly sensitive to matters affecting small business.

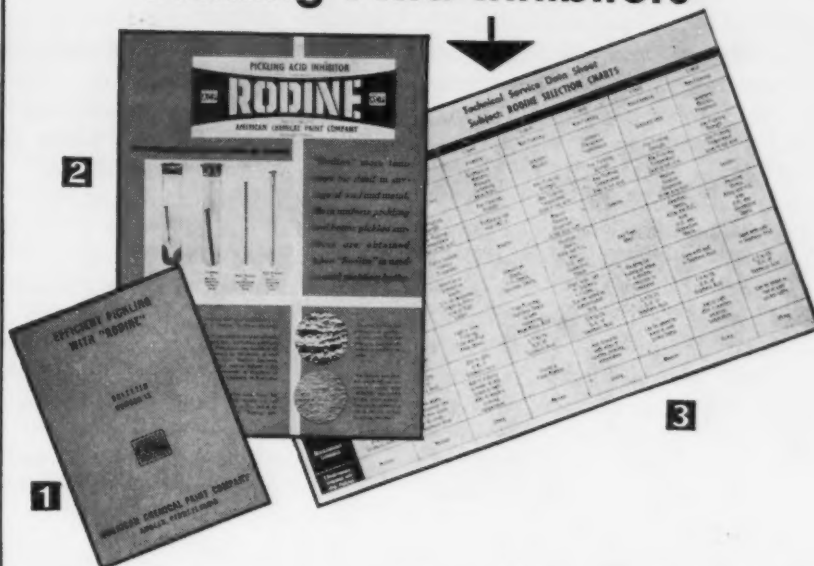
But conduct of the Bureau is important to all industry and business, Mr. Weeks says, because it runs the tests on which the FTC and the Post Office Dept. base decisions as to a company's advertising privileges.

In a recent address Mr. Weeks indicated that the Bureau of Standards would open its research files to small business and is now making available to exporters "the files on more than a million potential foreign customers."

New Data Available on ...

# RODINE®

## Pickling Acid Inhibitors



**1** The standard reference work on pickling, "Efficient Pickling With RODINE" — Bulletin Number 13 — is now available in a new, revised edition.

**2** This new 4-page general descriptive folder presents essential information on "Rodine" pickling acid inhibitors.

**3** The recently revised "RODINE SELECTION CHART" gives characteristics of and uses for typical "Rodines" used with sulfuric and muriatic acids. Technical Service Data Sheet No. 13-1-1-4.

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April 9, 1953

# ENAMEL: Heavier Spray On Market

Porcelain enamel industry advances on two fronts . . . Conventional uses grow . . . High temperature coatings are huge new field . . . Industry eager to try new ones—By T. Metaxas.

While most porcelain enamellers spray their ground "glass" coats on a growing metalworking market, a sprinkling of pioneers are building a base for a wide extension of the industry.

Working under Air Force and commercial airlines contracts, they are putting ceramic jackets on steel parts to upgrade resistance against mounting temperatures of jet and piston aircraft engines. Spillover effect of this production and research will in years ahead mean many millions of dollars of ceramic-coated parts for industry in general.

## Old Uses Grow

Meanwhile conventional porcelain enameling advances on old product fronts. In a decade, business volume has almost doubled and growth continues more than a pace ahead of the general industrial rise. Most of the field is letting the big money pave the way on high temperatures coatings.

Instigating development of the "hot" coatings is the rising range of heat metals must withstand in aircraft engines and guided missiles. Added thrust to research is the knowledge that shortages of alloys needed to make heat-resistant metals are all too possible.

Solar Aircraft Co., Calif., developers of Solaramic coatings, reports it has "stacks of requests" from oil fields, food processors, auto plants, makers of electrical equipment for test information on specific applications.

Now supplying special coatings for some industries, Solar admits it hasn't "scratched the surface."

Industry can judge how it may use high heat coatings by learning why they must be used in jet engines. First, the coats permit alloy steels to endure fiery heat for longer periods. A coated metal

lasts longer than a naked one, achieving significant cash economies. In many cases, a coated low alloy steel takes the place of a steel rich in critical alloys.

Coatings resist heat and gas corrosion of metal, reduce occurrence of hot spots, embrittlement, oxidation, warping. Applying these results to itself, industry can use ceramic coated steels to get operating economy and efficiency wherever heat, acids and corrosives ravage metals.

While a small sphere of the industry flies with the Air Force over new frontiers, the bulk is pressing traditional applications of porcelain enameling.

White organic enamel finishes and lacquers baked on at comparatively low temperatures are less expensive to apply, but porcelain enamellers defend their product as

durable, permanently beautiful—and cheaper in the long run.

In a recent survey by Davee, Koehnlein & Keating, Chicago market research firm, investigators visited 2349 homes, examining refrigerators for damage. Of refrigerators 4 to 6 years old with porcelain enamel exterior finish, 32 pct were reported damaged. But of the boxes 4 to 6 years old with synthetic lacquer finishes, 70 pct were classed as damaged.

## Ranges Get Hot

Hottest item on the porcelain enameling product roster is the kitchen range. In 1920 dollar value of the enameled part, including cost of steel, fabrication, and enameling, was a scant \$2 million. This value spurted to \$14 million in 1930—by 1940 had reached \$29 million and by 1950 had climbed to \$46.6 million. (See Table.)

One skeleton in the closet—porcelain tabletops where the industry was assaulted by plastics—rattles occasionally. But when the overall gain is considered, it seems porcelain enamellers have backed nearly all the right horses.

Right now the industry is getting set to pick a few more. Its entrance into at least three new or expanded markets seems inevitable. These are: Fine arts (decorative finishes for home furnishings), industrial equipment, and architectural.

As a major building material, porcelain enamel curtain walls are "superlative," one industry executive told THE IRON AGE. Reliance on flat surfaces by the modern architect sometimes leads to drab effect. With porcelain enamel he not only gets durability, ease of maintenance but can use all the colors of the rainbow.

Masonry has been replaced by porcelain enamel curtain walls in General Motors Research Center and the Armco Research building.

While enamellers have been making coatings thinner, they have also been making them stronger and less likely to chip. Research continues on methods to apply a single white coat on steel.

## Porcelain Enamel on Steel (Thousands of Dollars)

	1950 <sup>1</sup>	1940 <sup>2</sup>	1930 <sup>2</sup>
Ranges . . . . .	\$46,600	\$29,000	\$14,000
Refrigerators . . . . .	27,100	14,500	8,000
Washing Machines . . . . .	13,300	18,000	3,000
Cooking Utensils & Hospital Ware . . . . .	36,100	16,000	12,000
Table Tops . . . . .	3,000	5,000	4,000
Industrial Equipment . . . . .	26,600	12,000	10,000
Signs . . . . .	6,000	6,000	5,000
Reflectors—Lighting . . . . .	15,000	12,000	11,000
Architectural . . . . .	10,000	1,000	—
Steel Plumbing Fixtures . . . . .	35,000	15,000	3,000
Jobbing . . . . .	20,000	9,000	7,000
Hot Water Tanks . . . . .	10,000	1,000	—
	\$248,700	\$128,500	\$77,000

<sup>1</sup> Based on Commercial Research Report

<sup>2</sup> Estimated

NOTE: The figures cover dollar value of the porcelain enameled part including steel, fabrication and enameling.

# VENEZUELA: Pledged Aid on Steel Mill

**Plans to build steel industry move from dream to decision stage . . . U. S. Steel Co. promises fullest help . . . Site may be river junction where power's planned—By W. V. Packard.**

Venezuela's national aspiration to establish its own iron and steel industry is moving from the dream stage to the decision stage.

An important first step was taken last August when the Venezuelan Iron Syndicate was formed to study prospects for establishing such an industry.

Probably an equally important second step was the promise of all possible cooperation and assistance that came from U. S. Steel. The promise was first made when the Iron Syndicate was formed. It was repeated personally by Ben Fairless, U. S. Steel chairman, during his recent tour of inspection in Venezuela.

## In It Together

The U. S. Steel promise is significant. It indicates the feeling of partnership Corporation officials have toward the Venezuelan Government and people. The U. S. Steel offer of full information and technical assistance will be carried out as fully as Venezuela wants. It will cost the Venezuelans nothing.

The offer is very comprehensive, covering free access to all information at the Corporation's disposal in such broad fields as engineering and technical problems, market surveys, and operating questions. If the Venezuelans decide to build an iron and steel industry, they will get fullest possible technical assistance from U. S. Steel.

## Will Welcome Engineers

If Venezuela or the Syndicate wishes to send engineers to North America to study steelmaking first hand, they will be welcomed at U. S. Steel mills and mines.

The Syndicate will work closely with the government in studying establishment of an iron and steel industry in that country. Study is expected to cover raw materi-

als, equipment, potential market, transportation and costs.

Prospects of high construction costs, competitive world steel markets, and slim profit margins will be weighed against prospects of creating new jobs, new outlets for raw materials, new source of steel supply, and strengthening national defense.

## Where to Put Mill

Whether or not it is decided to build an iron and steel industry in Venezuela, the question highlights an advanced degree of cooperation between U. S. Steel and the Venezuelan people, their government and industry.

If it is decided to build a steel industry, a likely location would be near the junction of the Orinoco and Caroni Rivers. The steel works would tie in nicely with a huge hydro-electric power project already proposed for nearby Caroni Falls.

Lack of coking coal is a complicating factor in sizing up steel-making possibilities. Proximity of high grade ore would tend to off-

set need to import coal or coke, which could be brought in by water.

Also under careful investigation is the possibility of piping natural gas from the oilfields of Anzoategui to reduce the ore in a manner similar to Swedish technique. Ore samples have been sent to Sweden and elsewhere for reduction tests.

## Build Aluminum Plant?

Also under careful study is a plan to build an aluminum plant in the Orinoco-Caroni vicinity. This would be contingent on the Caroni Falls power project being approved. Bauxite could be brought in from British or Dutch Guiana by water.

In the long run opening of the lower Orinoco may prove far more important to Venezuela than opening of her ore treasure chest. Steel, power, and aluminum industries could hardly be considered without water transport. If one or more of these industries are established, manufacturing plants could be expected to spring up.

Opening of the Orinoco brings world markets within reach of mineral and forest resources (in addition to iron ore). Rich farm and grazing lands are another wealth potential that will be unlocked by river transport.

## West Europe's Economy Skidding

America's hopes for an economically stronger West Europe have been chilled by a recent survey by the United Nations Economic Commission for Europe.

The survey finds that "the economy of West Europe has for about 1½ years lapsed into stagnation." Demand has dropped off and profit margins are lower. Production and trade have been checked in spite of increased defense activity.

Topping the list of economic ills is the dollar shortage. West Europe has boosted dollar and gold reserves recently, but only by cutting imports, not boosting exports. The commission estimates that West Europe must boost dollar exports or trim imports \$2 to \$2.5 billion to even partially solve its problems.

The report suggests a four-point program:

- (1) Increase sales to dollar countries.
- (2) Boost raw materials production in non-dollar countries.
- (3) Cut imports from the U. S. by increased restrictions and by strengthening competition of European producers.
- (4) Get more dollars and essential imports in return for goods and capital to be supplied by West Europe to affiliated countries.

# MOBILIZATION: Plan Agency Shuffle

**White House would make ODM permanent . . . NSRB would go out . . . Munitions Board would lose stockpile program . . . Plans start June 2 if Congress gives OK—By A. K. Rannels.**

Office of Defense Mobilization would be made a permanent agency under a new White House reorganization plan, and varied scattered activities relating to national defense planning would come to roost beneath ODM's wing.

Plans for the central defense mobilization agency have been submitted to Congress. They would become effective June 2 unless voted down by one house or the other.

Major changes revolve around the National Security Resources Board and the Munitions Board.

## Eliminate NSRB

Under the reshuffling, the NSRB would be abolished and its responsibilities and activities transferred to the new ODM.

In addition, the responsibilities of the Munitions Board with respect to stockpiling of critical and strategic materials would be taken away and likewise turned over to ODM.

It is obvious, says the White House, that stockpiling is a vital defense planning activity, and is tied in closely with production planning and conservation measures, and therefore should be under the ODM roof.

## No Change For GSA

Both the Defense Dept. and the Interior Dept. will have specified representatives to keep ODM advised on defense requirements, military needs, and the availability of raw materials.

But there their responsibility ends. Final word on stockpiling would be in the lap of ODM. No change is made in responsibility of General Services Administration. It will buy when told, it will make provision for warehousing and storage.

Talk is that the Munitions Board is due to be abolished and its responsibilities other than stockpil-

ing turned over to a Defense Dept. division under an assistant secretary.

The White House remains tight-lipped on this subject. But the President on last Monday sent to Congress the name of the present ODM Acting Director, Arthur S. Flemming, as his choice to become head of the revamped agency.

The White House told Congress there are two major reasons for the new set-up. One is that it will streamline, tighten, and improve the executive office organization itself.

The other is that it places defense planning under one agency head, thereby eliminating the "confusion of responsibilities" that now exists.

## Navy Steps Up '53 Spending Rate

Navy Dept. has moved ahead of the Army in fiscal 1953 obligations for military construction, plant expansion, and procurement of major items, but the Air Force is dominant in this field with obligations of \$11 billion.

Statistics for the first 8 months of the year showed the Navy had accounted for \$5.5 billion and the Army for \$5.4 billion. Interdepartmental obligations for construction amounted to \$100 million.

Represented by these totals are contracts with private industry and project orders placed with production facilities run by the military.

## Hard Goods Took Most

Obligations for all services in the July 1951-February 1953 period included \$17.8 billion for tanks, guns, planes, ships, and other "hard goods," \$2.4 billion for food, clothing, and fuel, and \$1.8 billion for construction.

Total obligations of all types during the same months amounted

to \$34.3 billion. This figure takes in military pay, research and development, and other activities, as well as procurement and construction.

In the first 32 months of the Korean emergency, defense obligations amounted to \$145.9 billion, of which \$102.5 was for procurement and building. Bulk of this latter amount, or \$85.6 billion, was obligated for "hardware."

## Change Tool Renegotiation Rules

Processing of renegotiation cases involving subcontract sales of machine tools and other durable equipment will be handled in somewhat different manner by the Renegotiation Board, which made a recent change in its regulations.

The amendment reduces the part of the subcontract price that is subject to renegotiation by recognizing the percentage of time it is expected the equipment will be used in renegotiable production during the first year following its delivery.

This alteration in the regulations is explained in *Renegotiation Staff Bulletin No. 17*.

## Construction

### Fabricated Steel Shipments

February shipments of fabricated structural steel, as compiled from reports received by the American Institute of Steel Construction, amounted to 237,499 tons, approximately the same as the previous month but 4% below the corresponding month of last year when 246,398 tons were shipped. Shipments for the first two months of 1953 totaled 477,391 tons.

Bookings for February totaled 182,184 tons, a considerable decrease from January's bookings of 271,077 tons. Total bookings for the first two months of 1953 were 453,261 tons or at the rate of 226,631 tons a month as compared with 298,627 tons averaged monthly last year.

The backlog of work ahead as of February 28 stands at 2,128,389 tons.

A tabulation showing the retailed figures for the first two months is given below.

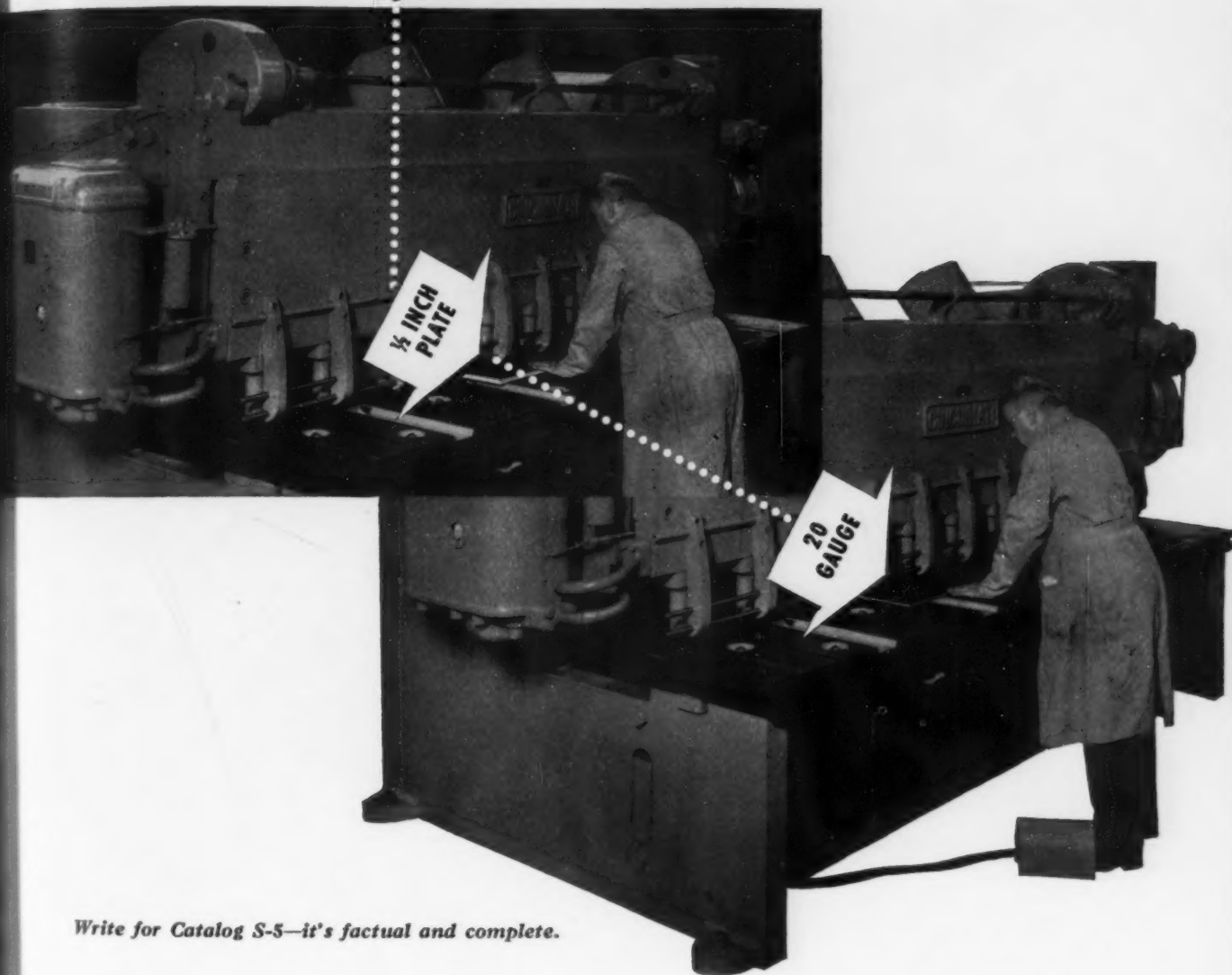
Estimated Total Tonnage for the entire industry			
CONTRACTS CLOSED	1953	1952	Avg. 1947-1950
Total Tonnage			
January	271,077*	213,110	161,970
February	182,184	230,832	152,190
Totals	453,261	443,942	314,160
SHIPMENTS			
January	239,892*	244,947	166,910
February	237,499	246,398	161,170
Totals	477,391	491,345	328,080
TONNAGE OF BACKLOG	2,128,389	2,408,032	1,212,330
Percentage scheduled for production within the next four months (To June 30)	50%	47%	58%
Percentage scheduled for production after the next four months (From July 1)	50%	53%	42%

\* Revised

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## Industrial Briefs

**Detroit Office . . . SANDVIK STEEL, INC.**, has opened an office at 20005 James Couzens Highway, Detroit. Butler C. Brewen is manager of the Coromant Div.

**Bon Voyage . . . Saul S. Schiffman**, secretary and treasurer, **TENNEY ENGINEERING, INC.**, Newark, will visit Europe in April and May to inspect a new Tenney stratosphere test chamber now being installed for the French Air Ministry at Palaiseau, near Paris.

**Steel Warehouse . . . SOLAR STEEL CORP.** has awarded a contract for a new steel warehouse and offices to be built on 20 acres of land in Cincinnati on Reading Rd. in the Sharonville section.

**Elected . . . Bonnie E. Trent**, of **ARMCO STEEL CORP.**, has been elected president of American Hot Dip Galvanizers Assn. for 1953-54.

**Coming Up . . . Institute of Metals Div., AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS**, will hold its seventh annual New England Regional Conference at General Electric Research Laboratory, Schenectady, on Apr. 23-25.

**New Company . . . U. S. MACHINERY & MOTOR CO.**, founded by Al Hamburg, is a new company which will be located at 401 Broadway, N. Y. It will deal in new and used machine tools, parts and accessories and render appraising and consulting service.

**Entering Field . . . MONSANTO CHEMICAL CO.**, Springfield, Mass., is entering the polyethylene plastics field.

**Named Distributor . . . ALLIS-CHALMERS MFG. CO.** has named George L. Smith & Co., 6450 W. River Parkway, Milwaukee, a distributor in portions of Wisconsin and Michigan.

**Big Sale . . . INTERNATIONAL HARVESTER CO.** reports the sale of 500 highly specialized International R-205 Roadlines to Associated Transport, Inc., New York.

**Rep Appointed . . . COPES-VULCAN DIV.** of Continental Foundry & Machine Co., Erie, Pa., has appointed Power Economy, Inc., St. Louis, as its representative.

**Appointed . . . NATIONAL FOUNDRY ASSN.** has appointed Charles T. Sheehan executive secretary.

**Any Questions? . . . BATTELLE INSTITUTE**, Columbus, Ohio, has established a new technological information service. Object is to help industry cover the ever-growing field of published research.

**New Plant . . . DETROIT STAMPING CO.**, Detroit, has opened a new assembly plant in Birmingham, Mich.

**Employment Up . . . WESTINGHOUSE ELECTRIC CORP.**, Buffalo, reports that employment is now at an all-time high with more than 121,000 persons and still rising.

**Going Up . . . FEDERAL ELECTRIC PRODUCTS CO.**, Newark, has under construction in Scranton, Pa., a new manufacturing plant which will be completed in September.

**Southern Rep. . . H. H. BUGGIE & CO.**, Toledo, has appointed Hart Engineering & Sales Co. Atlanta representative for Tennessee, Georgia, Alabama and Florida.

**Ready to Roll . . . THE BUDA CO.**, Harvey, Ill., has completed new plant facilities to increase production of its line of fork lift trucks.

**Spring Meeting . . . ASSOCIATED BEARINGS CO.**, Kansas City, will hold a 2-day series of spring meetings on Apr. 23-24 at the Sir Francis Drake Hotel in San Francisco.

**Sales Up . . . BORG-WARNER CORP.**, Chicago, reports net sales in January and February are 23.1 per cent greater than those of the 2 initial months of 1952.

**New Distributor . . . REYNOLDS METALS CO.**, Louisville, has appointed Mapes & Sprowl, Inc., 300 Burnet Ave., Union, N. J., as a distributor of Reynolds aluminum mill products.

**New Name . . . INDUSTRIAL CRANE & HOIST CORP.**, Chicago, is the new name of Industrial Equipment Co.

**Sales Jump . . . JACK & HEINTZ INC.**, Cleveland, reports total sales of \$29,629,052 in 1952, a 30 per cent increase over last year despite a 2-month strike.

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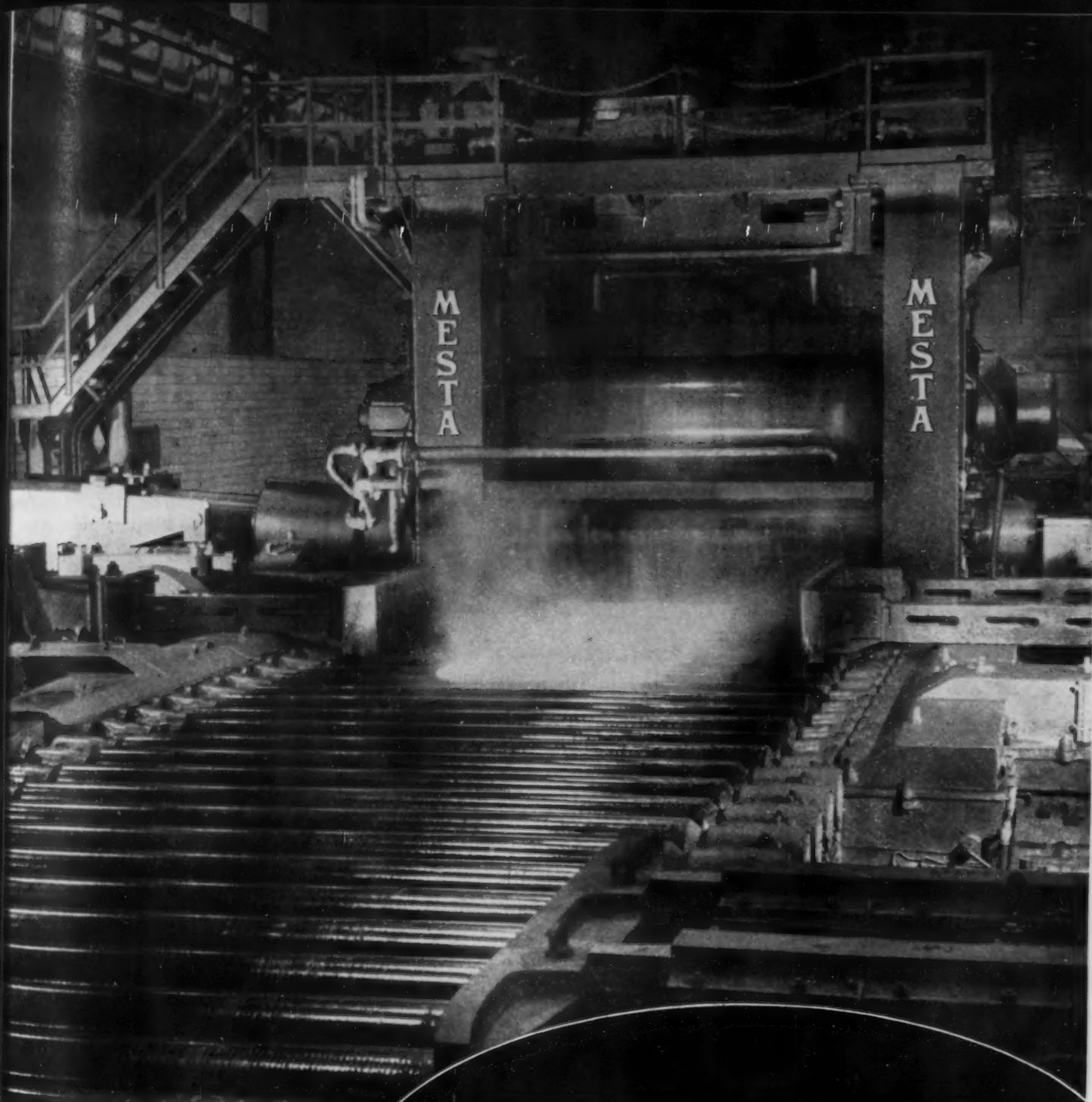
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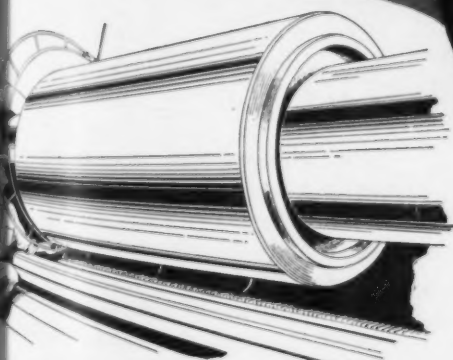
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## Detroit Is Tool & Die Hub Too

**Over 20 pct of all U. S. tool and diemakers work in Motor City area . . . Products essential to mass production auto-making . . . Job turnover low, infrequent—By R. D. Raddant.**

Detroit is often referred to as the automotive capital of the U. S. It might also be referred to as the nation's tool and die capital.

A just released study by the U. S. Dept. of Labor of mobility of tool and diemakers points this out clearly. But it is also clear that the tool and diemakers would not be there without the giant industrial parent which uses more tools and dies than any other industry.

**Needed By Automakers . . .** More than 20 pct of all the nation's tool and diemakers are located in Michigan, the bulk of them clustered in and around Detroit and outlying automotive cities such as Flint and Pontiac.

This is because the mass production techniques developed in the automotive industry demand tools and dies as well as jigs, fixtures and accessories requiring skilled tool and die men. In addition to the tool and diemakers employed in auto industries themselves, a network of tool and die shops, many of them sizable concerns, grew up around the auto industry.

Dept. of Labor survey states that an estimated 100,000 tool and diemakers were employed in this country in 1952 in 9000 different plants. Of these, 17 pct were employed within the auto industry. Another 5000, in the jobbing shop category, are connected directly with auto work.

**Stay Put . . .** Tool and diemakers are amazingly stable in employment. In the 1941-1951 decade more than half of them did not even change jobs. Of all categories, automotive personnel showed what the survey calls "the greatest degree of employer attachment." In

other words, fewer quit or were fired.

Economic betterment was the big single reason for tool and diemakers changing jobs. Good wages, security and chances of promotion in auto plants kept job mobility down.

**Training Troubles . . .** Another factor in tool and die employment is training, with apprenticeship the chief method. About two-thirds

### Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Apr. 4, 1953 . . .	147,845*	34,310*
Mar. 28, 1953 . .	142,216	34,533
Mar. 29, 1952 . .	97,371	28,297
Mar. 22, 1952 . .	101,776	31,074

\*Estimated Source: Ward's Reports

of the men interviewed in the survey had served apprenticeships. But more than four-fifths of all tool and diemakers in the motor vehicle industry had been apprentices.

It should be pointed out that there is not unanimous agreement on apprenticeships. Independent shops especially feel that an artificial labor pressure is being created by long apprenticeships—that men could be upgraded faster and room made for more apprentices than is permitted under union contracts.

In contrast to the high apprenticeship in the auto industry, lowest proportion of apprentice trained men is in the aircraft industry, only 33.8 pct. This is explained by rapid growth of the industry and by its location away from metal-working centers.

Almost 85 pct of the workers

who qualified for the trade while employed in the auto industry served as apprentices against 25 pct who learned the trade in the aircraft industry.

**Where & When . . .** These are some interesting statistics, not necessarily vital, but informative:

Native born percentages in tool making centers are: Chicago, 69.6; Cincinnati, 75.8; Cleveland, 80.4; Detroit, 63.7; Hartford, 83.5; Los Angeles, 84.4; Philadelphia, 82.8.

Medium ages of tool and diemakers: All industry, 44; fabricated metal products, 43; machinery, 48; machine tool accessories, 41; electrical machinery, 40; motor vehicles, 49; aircraft and parts, 42; all other industries, 39.

**Most Critical . . .** The mobility study, which showed principally that the auto industry employed the most tool and diemakers for the longest periods of time, is the first of a series connected with mobilization manpower planning. Funds for this study were provided by the Air Force.

Tool and diemaking was selected as the first occupation to be studied because of its vital importance to a mobilization economy. Their highly skilled craftsmanship and long period of training makes tool and die men perhaps the most critical item in terms of manpower.

**Who Wears The Pants? . . .** Men who take pride in claiming that they picked out the family car without help or advice from the distaff side of the family may be just kidding themselves.

Paul R. Davis, general sales manager of Studebaker, claims that women, who are generally believed to influence such superficialities as styling, color and trim, actually have a major effect on engineering developments.

"If men would take a close look at mechanical advancements they would find that these improve

ments were made primarily to help the little lady who handles the family taxi service," Mr. Davis says.

He points out that power steering, probably the major innovation in recent years in the accessory, or appliance, field, was developed with women in mind. Men drivers had complained very little about steering resistance.

## Ladies First

Same goes for automatic transmissions. This doesn't mean that the male side of the family does not benefit from developments that ease driving, but it was the so called weaker sex that was first considered.

Mr. Davis points out that little conveniences like glove compartments, assist straps, inside lighting, and floor rugs all were developed to please the feminine taste.

Borrowing a slogan, "Never underestimate the power of a woman."

## Mirrors Test Crankshaft Strain

Ford engineers seem to develop more cute gadgets for measuring and testing than any in the industry. Last week it was isotopes; this week it is 240 tiny mirrors.

New invention, developed by Dr. H. K. Moore and Robert Roggenbuck, measures twist and shows for any engine the speed at which crankshaft strain is greatest.

A special fan belt pulley is used for the engine in test. The wheel has 240 gear teeth cut into its face, each tooth chrome-plated. When revolving, each tooth becomes a spinning mirror. Light beams from the mirror are picked up by a photoelectric cell.

Crankshaft twist sets up a vibration pattern which disturbs the rotation speed of the pulley wheel. This change is analyzed by means of the photoelectric cell and a radar scope which shows the vibration graphically. Its developers claim it provides a greater degree of accuracy than any other twist indicator in the auto industry.

## Research:

### Chevrolet maps new engineering buildings at GM center.

Chevrolet, world's biggest auto producer, has announced plans for a new engineering center in keeping with the GM division's top spot in the industry.

At the moment, Chevrolet's engineering facilities are located in cramped and in some cases makeshift facilities in the General Motors Building and other scattered points in Detroit. Need for new quarters became more and more apparent in the past year under the aggressive expansion program of Chief Engineer E. N. Cole.

### At GM Center

New center will be located at the southeast corner of the GM Technical Center northeast of Detroit. It will consist of three structures, an engineering administration building, an experimental shop, and a laboratory. The

administration building is scheduled for completion first, in about 18 months. The other two are expected to be completed in 2 years.

T. H. Keating, Chevrolet general manager, promises the engineering facilities will be "second to none in the automotive industry." The new development will provide close to half a million sq ft of floor space, considerably more than present facilities.

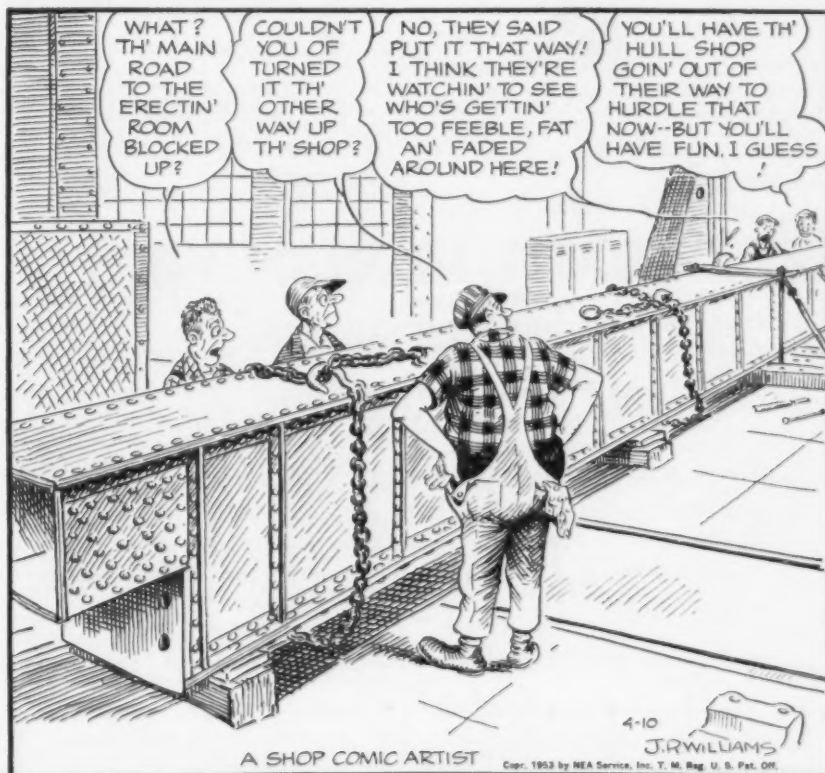
### Will Harmonize

Those familiar with the GM Technical Center recall its landscaping and the modern architectural styling of its buildings. Chevrolet engineering will have its own identifying architecture and separate entrance, but will be harmonious with the rest of the center.

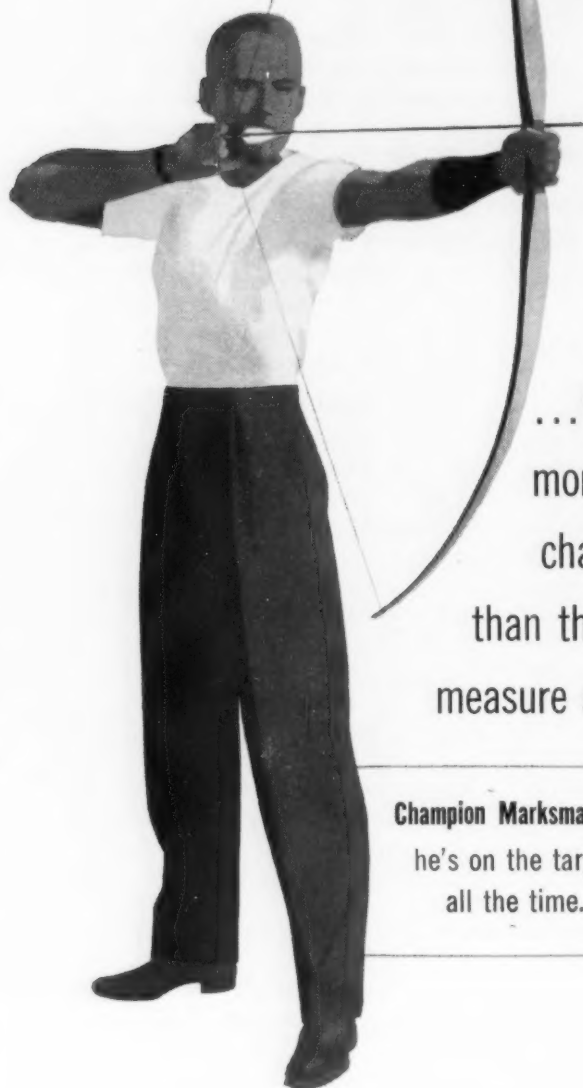
In the GM organization, each division has its own engineering staff and facilities in addition to the vast experimental and development facilities of the new technical center, only part of which has yet been constructed.

## THE BULL OF THE WOODS

By J. R. Williams



# IT'S PERFORMANCE THAT COUNTS



...there's  
more to a  
champion  
than the tape  
measure shows!

**Champion Marksman...**  
he's on the target  
all the time.



**Average Marksman...**  
he may measure the  
same, but he misses  
when conditions  
are tough.

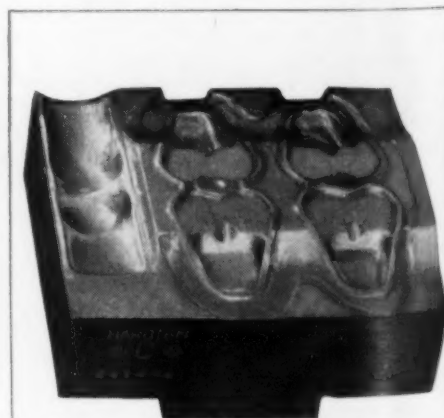
## HARDTEM DIE BLOCKS

perform like "champions"  
in your production line!

Heppenstall Hardtem Die Blocks perform like "champions" because they possess those extras that result in superior quality. Their patented steel analysis resists softening and heat checking in service. Records from plants using Hardtem Die Blocks prove the following benefits for production:

- ★ Long life of dies    ★ Holding of true dimensions
- ★ Less down time    ★ Longer production runs
- ★ Lower overall die cost

It will pay you to try Hardtem Die Blocks. Call Heppenstall Company, Pittsburgh 1, Pa. Sales Offices in principal cities.



**Heppenstall**

The most dependable name in die

## This Week in Washington

### Keep Your Mouth Shut On War Work

**Businessmen can cause dangerous security leaks, Defense Secretary Wilson warns . . . Orders tighter censorship over defense work data . . . Too much talk—By G. H. Baker.**

Leakage of military secrets to enemies of the U. S. isn't all due to loose talk and careless handling of documents by the Army, Navy, and Air Force. Competition among defense contractors also accounts for some dangerous disclosures, according to Defense Secretary Charles E. Wilson.

To plug what the Pentagon terms a "growing number" of security leaks, Secretary Wilson in two new memoranda has ordered a general tightening of Army-Navy-Air Force prohibitions on the handling of all secret and confidential matter. Orders apply equally to machinery (including all mechanical or electrical devices) and to printed or graphic material.

Some recent disclosures have "seriously affected" the national security, Mr. Wilson warns. He does not name the specific violations he has in mind. But the Defense Dept. boss is reported to be burned over newspaper disclosures at the size and form of upcoming cuts in military spending. Reports of this type, it is believed, provide "vital intelligence to countries hostile to the U. S.

**Be Friends . . .** New Defense Dept. target date of Jan. 1, 1954, for completion of the long-awaited combined military procurement catalog reflects fresh Pentagon willingness to get along with Congress.

Military supply experts had, up until recently, shown slight disposition to merge Army, Navy, and Air Force shopping lists. Only after prolonged needling from Congress did the Defense Dept. agree to speed work on the cataloging job that had languished in

an on-again-off-again status since 1947. Firms in the market for defense contracts will find it easier to learn what the government is buying after the single catalog makes its appearance.

**Stop Press . . .** Quarterly reports of the Office of Defense Mobilization—familiar Washington publications on government planning under ex-President Truman—have been dropped. First of the reports appeared two years ago over the signature of C. E. Wilson (General Electric), the then defense mobilizer.

Omission of the quarterly reports leaves unanswered a number of pertinent and basic mobilization questions, such as:

Has the mobilization base (goals and quantities) been set yet?



NEW BOSS of Federal Trade Commission is Edward F. Howrey.

What's being done about the Vance Committee recommendations for stockpiling machine tools?

Will fast-amortization certificates continue to be issued indefinitely?

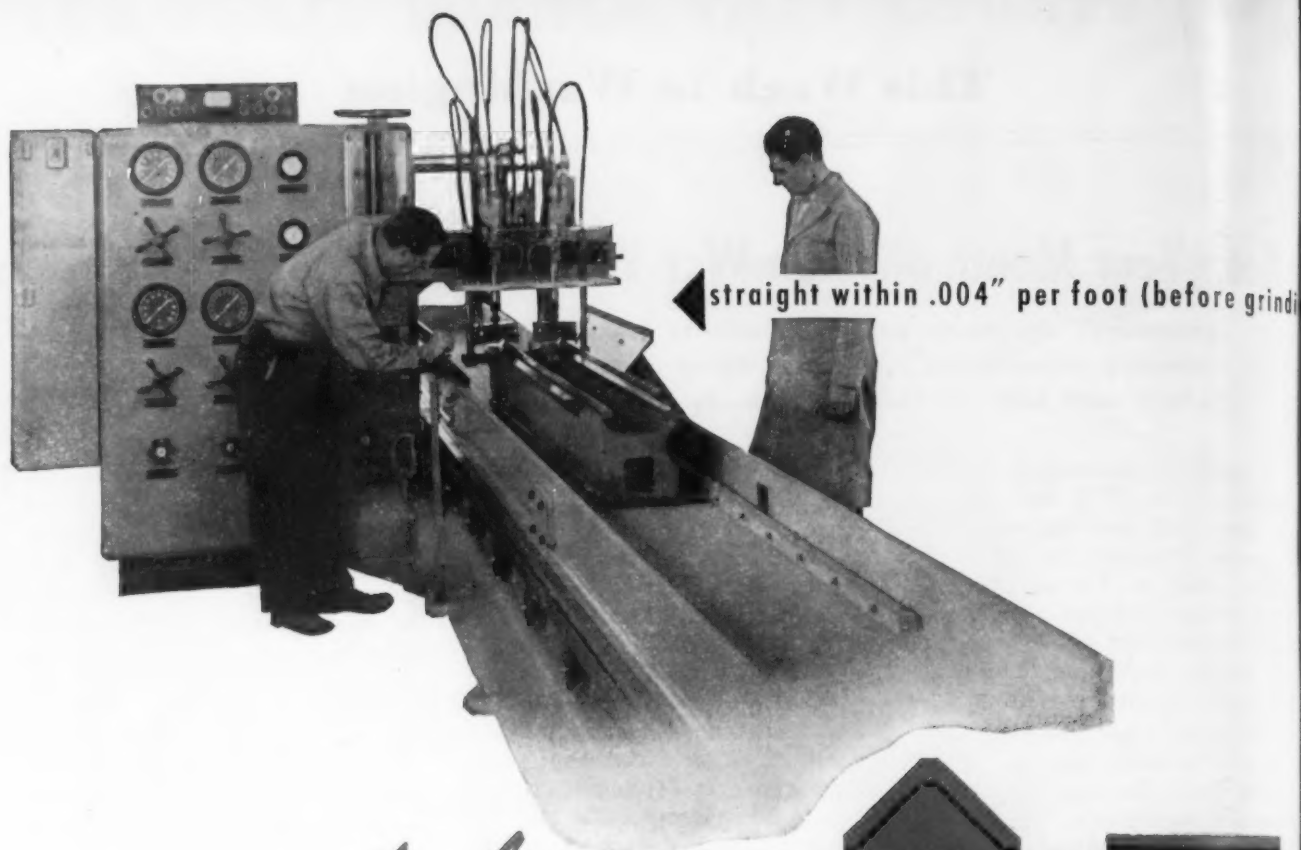
In the eight quarterly reports that were published under leadership of three mobilization directors (C. E. Wilson, Manly Fleischmann, and Henry H. Fowler), industry gained periodic answers to these and other mobilization questions and was able to keep abreast of changing defense goals as set by Washington. While a final decision on whether or not to issue any more of the reports has not been reached, tentative unofficial decision of the White House is to drop them.

**Pro & Con . . .** Fresh setting for now-familiar arguments for and against the proposed St. Lawrence Seaway will be provided next week by the U. S. Senate.

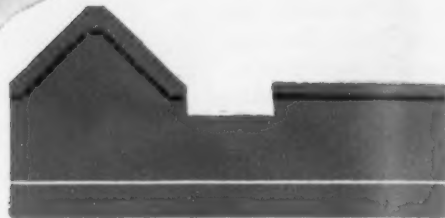
Chairman Alexander Wiley, R., Wis., of the Senate Foreign Relations Committee, is planning three days (Apr. 14, 15, 16) of public hearings on legislation providing for U. S. participation with Canada in developing the seaway for both navigation and power.

**Keep Power Rationing? . . .** Power rationing in the Pacific Northwest may continue indefinitely. As officials of the U. S. Interior Dept. see it, the Federal Government's authority to allocate generator output in the Northwest and other power-hungry areas must be continued, despite the announced intentions to dump industrial controls.

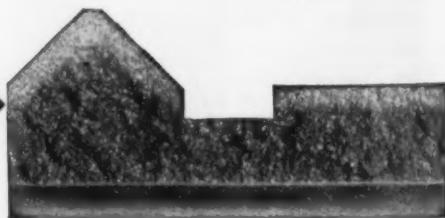
Secretary of the Interior Douglas McKay points out that aluminum reduction in Washington and Oregon may suffer drastic cutbacks if Congress curtails his authority to allocate power. He is seeking a 1-year extension (to June 30, 1954) of allocation authority now provided.



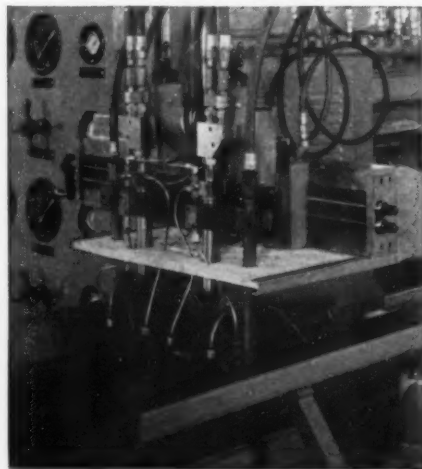
*specified* →



*achieved* →



## lathe bedways flame hardened to Shore 70-75



Cincinnati Flamatic makes news again: selective "flat hardening" that adds an important sales feature to Cincinnati Lathe & Tool Co. Tray-Top Cintilathes, and cuts costs at the same time. The job was to (1) give maximum surface hardness to the cast iron bedways (2) maintain a uniform pattern (3) keep the ways straight within grinding limits (4) obtain high production.

A special Flamatic hardening machine with stationary flame heads with integral spray water quench (see closeup) does a straight-line production job. Work travel is 6" per minute. Floor-to-floor time is less than one hour per 72" bed. Customer requirements more than fulfilled.

Gears, cams, rollers, parts with multiple diameters, etc., up to 18" OD depending on width or shafts up to 24" long depending on OD are readily handled on the Standard Flamatic. Write for Catalog M-1724 which gives case histories. Send part prints for analysis, recommendations.

# flamatic

THE CINCINNATI MILLING MACHINE CO.

Cincinnati 9, Ohio, U.S.A. •

CINCINNATI

## SMALL BUSINESS: May Get Own Agency

**Commerce's Weeks says kill RFC, keep loans for small business . . . Administration-backed bill would give small firms their own agency for loans, other help in peace and war.**

As a direct result of close teamwork between the White House and Congress, new legislation to set up a powerful "Small Business Administration" now stands at least an even chance of winning early Capitol Hill approval.

Commerce Secretary Sinclair Weeks last week came out in support of the move to kill off the Reconstruction Finance Corp. But continued availability of government funds to aid small business was a strong prospect.

Mr. Weeks believes there is no longer any need for RFC from an overall standpoint and that business in general should stand on its own feet. He advocated that only the authority to make small business loans should be retained.

### No Source of Loans?

Coming shutdown of the 21 year old RFC will, unless some positive action is taken by Congress, leave smaller firms without a source of funds in Washington.

But under the new Administration-backed bill now before the Senate, smaller firms will have both a ready source of funds, and a champion at the Capitol—backed with complete legal authority to fight their battles with other government agencies.

Senator Edward J. Thye, R., Minn., chairman of the Senate Small Business Committee, and sponsor of the new bill, says his SBA proposal will authorize Washington to assist small business in times of peace as well as in war. The agency is to be set up on a permanent basis.

Under Senator Thye's proposal, SBA will pass on the merits of all loan applications and will itself handle the financial details of all approved loans. At the present time, Small Defense Plants Administration must refer all approved loan applications to RFC

for disbursement and fiscal processing.

SBA would have authority to lend up to \$150 million—either in loans or in negotiating contracts without competitive bidding. A total of \$100 million of this total would be specifically set aside for direct loans, and the other \$50 million would be for contracting and subcontracting. Periods of credit would be limited to 10 years. Individual loans would be confined to a ceiling of \$100,000.

Among the purposes for which loans could be made: Expansion, new construction, conversion, research, acquisition of equipment, machinery, supplies or facilities.

## Outlook:

**Commerce Secretary Weeks sees '53 as good business year.**

A rosy future for business and industry this year is seen by Commerce Dept.'s Sinclair Weeks. This is based on reaction to price and materials decontrol as well as maintenance of business and employment at a high level through the first quarter.

"Every major industry covered by a nationwide survey just com-

pleted by the Commerce Dept. expects a higher sales volume in 1953 than in 1952," Mr. Weeks said.

Foundation for this optimism is, from an overall viewpoint, that continued high production since last November has been matched by new orders.

Backlogs have held steady at about \$73 billion over the past 5 months. A drop of \$2 billion below the third quarter 1952 average is charged off to the military stretch-out of its output timetable.

### How It Looks

The steel picture, says Mr. Weeks, speaks for itself with the March production rate at 10 million tons. Demand is seen as remaining firm on the basis of the following sales outlook, based on statistics from Commerce's latest survey, soon to be released:

**Transportation Equipment**—Backlog is close to \$27 billion, sales expected to be up 32 pct from last year.

**Automobile Manufacture**—Backlog estimated at 8 months of current sales level, new sales expected to increase 18 pct.

**Machinery**—Backlog close to \$21 billion, new orders strengthening with electrical machinery producers expecting an increase of 14 pct.

**Communications**—Radar, radio, television and other equipment backlogs at 13 months, and still rising as a result of new orders.

**Mining Companies**—Expect a minimum increase of 4 pct over business of last year.

**Non-rail Transport**—Highway and waterway transportation expect 5 pct increase; air transport 11 pct.

**Non-manufacturing** — Petroleum, 3 to 4 pct; gas companies, 15 pct; electric power, 9 pct increase in sales.

## U. K. to Buy American Steel

Mutual Security Agency has authorized the United Kingdom to purchase \$2,500,000 worth of steel mill products from American mills.

Purchases are likely to be made through the British Iron & Steel Corp. in New York and likely will be confined to semi-finished forms.





# NOW *Cost-cutting, servo-type* "touch control"

up to **75 tons**

With this new and bigger

## **MULTIPRESS®**

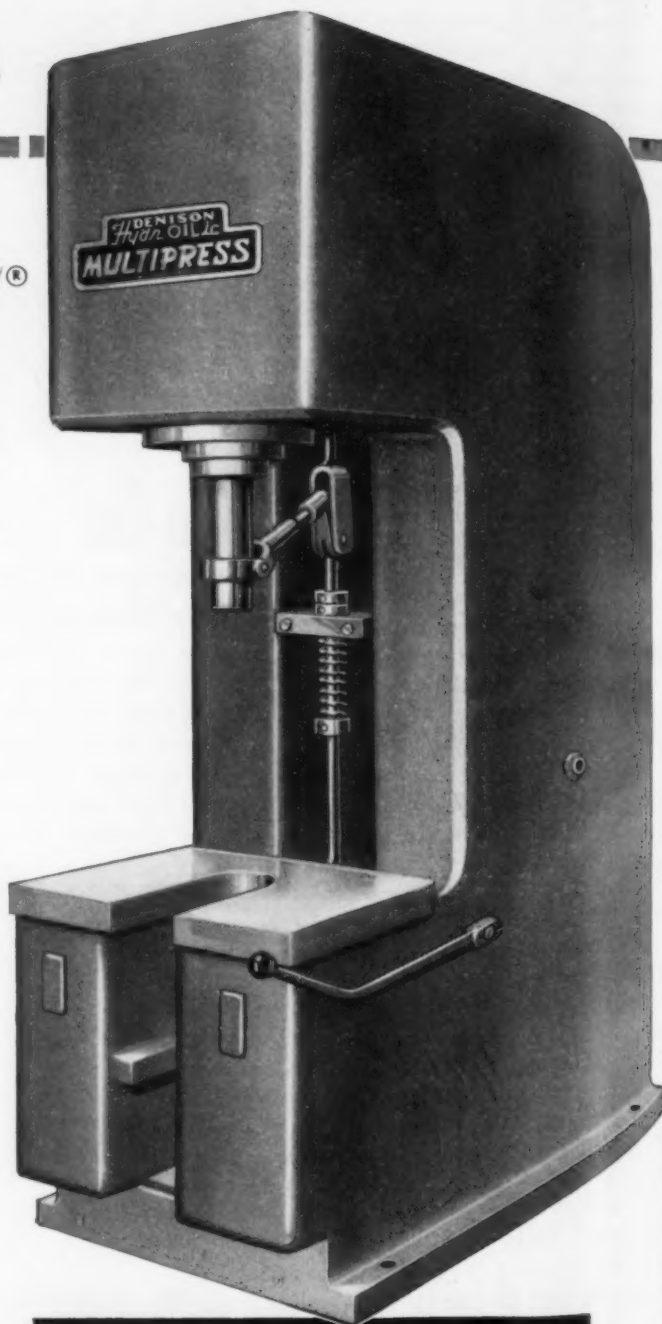
you can now have all of the operating advantages of the well-known Multipress line — plus the advantages of the new servo-type Touch Control... for applications up to 75 tons!

**IDEAL FOR STRAIGHTENING, DIE SINKING, COMPACTION, ASSEMBLY.** With this new heavy-duty *Touch Control* Multipress, you can make the ram travel fast or slow... stop or reverse it any time... hold it at any point... bear down on the work with a few pounds of pressure or all 75 tons... repeat pressures as rapidly as you can manipulate the hand levers... and hold pressure on the work for any needed dwell period.

Touch Control gives the operator a positive, direct "feel" of the operation — adds his own skill to the smooth, dependable accuracy of the Multipress ram. And he gets *instantaneous response* to every action of the hand lever.

Applied pressures are quickly and accurately shown on the dial gauge. Stroke length is fully adjustable at both upper and lower limits. Maximum tonnage can be preset at any pressure within the limits of the press.

The 75-ton Multipress offers a 30-inch daylight opening (or gap)... 34-inch work table width... 13-inch throat depth... and a ram stroke that's fully adjustable up to the 15-inch maximum. Height, only 106 inches. Write today for full details on this versatile, big-job Multipress with TOUCH CONTROL.



**The DENISON Engineering Co.**

1158 Dublin Road, Columbus 16, Ohio



## West Coast Report

### Industry Optimistic On Defense Cuts

**Coast manufacturers see few defense order cutbacks if Korea peace feelers materialize . . . Area has 17 pct of prime contracts . . . Aircraft most precarious—By T. M. Rohan.**

Western defense industries—holding 17 pct of U. S. prime defense contracts—watched Korea peace moves with mixed emotions last week.

Hoping for an end to war, all believe wholesale cancellation of contracts such as followed V-J Day will not re-occur—and many are backing their convictions with cold cash.

Aircraft firms are in the most precarious position with 95 pct of their \$7.5 billion backlog in military orders. But all believe the 1952 defense order stretchout will permit continued high output.

**See No Slowdown . . .** Lockheed, with \$2 billion in contracts—all but 7 pct military, has just reached the production volume aimed at for the past 2 years. Executives believe their military contacts would see no slowdown with a sudden Korean peace.

And heavy ordnance manufacturers are going ahead with expansion and continued high production, much of it with their own money.

**Hit West Hard . . .** But if heavy cancellations should come, the West would be one of the hardest hit U. S. areas. The West Coast aircraft industry has more than doubled its employment with 130,000 new workers since Korea. Electrical machinery including electronics has also doubled with 30,000 new workers. Non-electrical machinery is up 40,000 and shipbuilding 10,000.

Largely defense, the combined new employment accounts for 210,000 of the 300,000 new jobs in the seven western states since Korea. This boom is reflected in a retail

spending increase of 28 pct since June 1950 compared with 9 pct nationally.

**Rolling Along . . .** It takes five identical wheels to get a new car on the road. This makes wheels big business in auto-jammed California.

Norris-Thermador, Los Angeles, which makes wheels for almost all western assembly plants, will expand output 50 pct to 300,000 monthly by July to meet order volume.

The existing plant, only one of its kind in the West, is running 7 days per week on two 10-hr shifts. A new line of 400-ton mechanical presses, double the size of those currently in use, is now being installed. Bigger presses, costing about \$200,000, in addition to boosting output, are necessary to handle larger wheels now coming into vogue.

**Demand Will Grow . . .** Using all western made hot rolled sheets and strip, the firm represents a major steel market. With new plants such as the \$50 million Ford assembly plant at Milpitas, Calif., going up,

output is expected to grow still more.

Wheels and allied parts like brake shoes and drums are still the only major auto items fabricated in the West. Orders must still be gathered from almost all assemblers to justify a high production line.

For other components such as fenders, doors, bumpers, etc., variety of models and available volume of each make die costs prohibitive, even with an increasingly favorable freight umbrella.

**Shells Main Item . . .** Bulk of Norris-Thermador's production currently is steel and brass shell cases, 75 to 105 mm, which has continued uninterrupted since before World War II.

And at Riverbank in northern California, three out of seven cartridge case lines for additional production are now in use in a wartime aluminum plant converted by Norris for the Army and Navy. A similar plant was put up by them at Louisville, Ky.

Steel cases are gradually supplanting brass in all but the 8-in., 55-lb. types where only brass will stand the heavy drawing. Other current civilian production at Norris-Thermador besides auto wheels includes steel bathtubs.

**Not Again . . .** Another Northwest power shortage threatened last week. Bonneville power officials report that without a heavy thaw or more rain in the next few weeks about 50 pct of the interruptible may have to be cut off.

Unless reservoir levels rise soon, Bonneville officials believe there will be 5 or 6 weeks (possibly starting this month) when part of the interruptible supply will have to be cut off from 4 to 6 hours per day. Most industries will probably be able to get adequate power from back-up steam stations but at a higher rate of about 7 mills per kwh.





...but  
*Experience Cannot be Copied*

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the “know-how” . . .

MARVEL is not “tied” to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other “composite” or “welded-edge” hack saw blades are merely flattering attempts to imitate—without the “know-how” of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been “tested”, “pre-tested”, and “re-tested” by thousands of users for more than a quarter-century!



ARMSTRONG-BLUM MFG. CO. • 5700 Bloomingdale Ave. • Chicago 39, U. S. A.

# Machine Tool High Spots

## Buy Tools With Eye to Automation

**Mass producers will hunt new ways of automation . . . Will be bigger factor in machine tool selling . . . Norton division program to automate grinding machines—By E. C. Beaudet.**

While the completely automatic factory is a long way from realization in the metalworking industry, there is little doubt that automation in a more restricted sense is fast becoming one of the prime factors in machine tool selling.

As defense backlogs of machine tool orders are worked off, it will assume even greater importance. High-volume manufacturers in a competitive market will more than ever be looking for methods to reduce costs and boost production per sq ft of floor space.

**Study Applications . . .** All types of machining or metal processing operations will undergo close scrutiny to determine whether they can reap the benefits afforded by automation. Experience gained in automating other earlier jobs will be used to determine new methods of application.

An example of this was reported recently by the Grinding Machine Div. of the Norton Co., Worcester, Mass., when it announced it was starting a vigorous program to automate grinding machines.

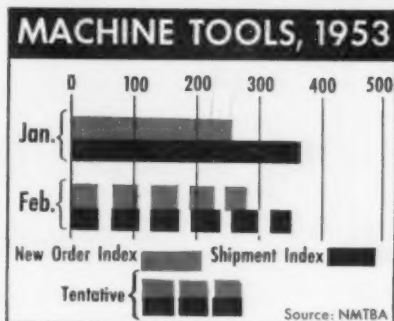
**Work on Transfers . . .** With one eye cocked on the post-defense selling period, Norton reveals that a major program for the development of transfer-type automatic equipment for grinding crankshafts is underway. Parts in such a machine would move from station to station for various grinding operations with no assistance from the operator.

Also included in the program is development of unit-type multi-slide machines with automatic work handling mechanisms. Grinding wheels mounted on heads would move in at various inter-

vals to grind a part and retract when the operation was completed. Most interest so far in these efforts has come from the automobile industry.

**Holding Accuracy . . .** Greatest difficulty encountered in automating grinding operations is maintaining the proper accuracy because of grinding wheel wear. This will mean more emphasis on development of automatic grinding wheel truing devices.

While the automotive industry will probably be the first to make



use of automatic grinding machines, their successful application in this field will mean that one more operation will be added to those already automated.

As has happened many times in the past, the experience and benefits of such endeavors will be passed along and adopted among the smaller volume producers.

**Compile Directory . . .** A directory of independent tool and die manufacturers listing approximately 1500 producers of special dies, molds, jigs, fixtures, gages, machines and related services has recently been published by the National Production Authority's Office of Small Business.

Purpose of the directory is to

aid companies seeking the services of tool and diemakers and to expedite production of these items for defense and defense-supporting requirements. The directory shows by symbols the types of special tools and services each manufacturer is prepared to furnish, the location of his plant and its size in terms of number of production employees.

**Jets Are a Problem . . .** One of the problems of the Air Force's jet engine program continues to be the fabrication of blades and buckets for these engines. Producers of these components are having difficulty meeting Air Force tolerance specifications.

Although there are various acceptable methods of fabrication in use, none, some sources claim, guarantee that any one of these methods will produce parts that will be 100 pct satisfactory.

**Tolerances Too Close . . .** This has led some to question whether the tolerances called for on these parts are actually necessary for satisfactory jet engine performance. No one is saying they aren't. Yet blades are being made and used even though they don't meet these rigid specifications.

Difficulties involved in making blades and buckets lie in properly locating the parts and in gaging. Standards for proper machining of contours still puzzles some companies. Others find difficulty in gaging accurately. They claim the errors inherent in gaging these intricate shapes already exceeds allowable limits.

**New Service . . .** Europe's largest builder of heavy machine tools, Schiess A.G., Dusseldorf, Germany, is investing \$250 thousand to form an American affiliate which will provide technical assistance to U. S. and Canadian plants using the firm's machine tools. Headquarters will be in New York with engineering, servicing and parts replacement located in Pittsburgh.

# The U. S. Steel Supply team that gives you *personalized service*



*...our salesman*  
**puts this team to work for you!**

**S**UPPLYING YOUR STEEL requirements becomes our team objective when you tell your needs to your U. S. Steel Supply salesman. Behind your salesman is a team of technical experts, each one a specialist in his field . . . and your business receives the attention of every member of the team who can contribute to its progress.

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**YOUR "ONE CALL" SOURCE OF STEEL SERVICE**

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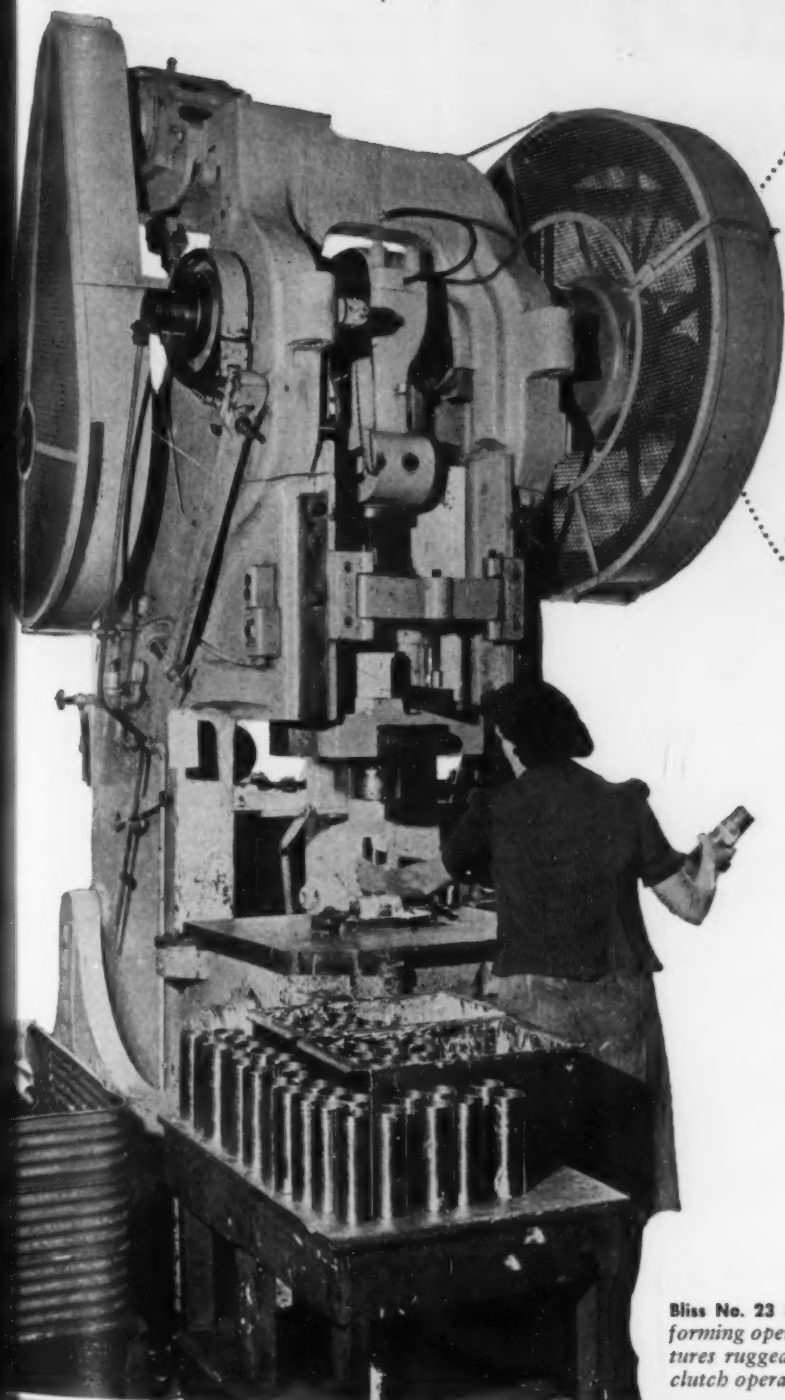


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*Not a dime spent  
on maintenance in  
8 years in **Snyder's**  
ALL-BLISS press shop*

Snyder Manufacturing Co. of Philadelphia discarded all their old presses and equipped their shop 100% with Bliss inclinable and straight-side presses back in 1945.

That was a significant decision for the world's largest manufacturer of television and auto radio aerials.

Results? In the eight years that Snyder's press shop has been all-Bliss, they have not had to spend a *single* dime on maintenance of the 25 Bliss presses.

And, as the press room accident rate dropped to zero with the Bliss presses, operators found they could run the presses faster.

The Snyder story is not unique. Bliss is the dominant factor in press room after press room. For a complete press room or a single press for a given job, you'll find it's best to call in Bliss.

**Bliss No. 23 Inclinable Press**, used by Snyder for forming operations on television accessories, features rugged construction, fast and dependable clutch operation.

**E. W. BLISS COMPANY, CANTON, OHIO**

U.S. plants at Canton, Toledo, Salem, Ohio; Hastings, Michigan

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## —Free Publications—

*Continued*

### Strainers

Bethlehem strainers are made for two kinds of service on liquid lines: The Simplex strainers, for non-continuous lines, and the Duplex strainers, for continuous lines. Straining baskets are available with coarse to very fine perforations, depending on the type of impurities to be separated, pressure in the line, and viscosity of the liquid. Complete details on the company's filters, baskets and oil heaters are given in a new brochure. *Bethlehem Steel Co.*

For free copy circle No. 14 on postcard, p. 165.

### Pumps

Worthington Corp. has issued a new bulletin covering both herring-bone gear-type and sliding-vane-type, heavy-duty rotary pumps. Engineering data in the books includes a viscosity conversion table, a chart showing the relation of the A.P.I. hydrometer scale to specific gravity and a viscosity temperature chart for fuel oils. The bulletin also gives information on fields of application and contains coverage charts, mountings and dimensions. *Worthington Corp.*

For free copy circle No. 15 on postcard, p. 165.

### Materials handling

A series of bulletins is available describing Elwell-Parker trucks and materials handling attachments. In addition the company has prepared a comprehensive 12-p. manual which gives essential details on its entire line of platform and fork trucks and floor cranes. *Elwell-Parker Electric Co.*

For free copy circle No. 16 on postcard, p. 165.

### Oils

H. E. Sanson's Powder'd Oils for cutting and grinding are self-cleaning and need no solvents such as are required by soluble oils to remove deposits. Powder'd Oil consists of a free-flowing powder mixed in the proportion of 2 lb of powder to each 50 gal of water. *Henry E. Sanson & Sons, Inc.*

For free copy circle No. 17 on postcard, p. 165.

# High precision slitter cuts .001" gage steel... with help of TIMKEN® bearings

TO INSURE the high precision needed to accurately cut .001" gage silicon steel, the Herr Engineering Company mounts the arbors of its multiple rotary slitter on Timken® tapered roller precision bearings. R. W. Herr reports: "... our main selling point on this piece of equipment is the high precision Timken bearings on the arbors which permit it to handle extremely thin material."

Because of their tapered construction, Timken bearings take radial and thrust loads in *any* combination. Line contact between rollers and races

gives them extra load-carrying capacity. And with precision Timken bearings, the arbors have a minimum run-out, assuring precision slitting.

The true rolling motion and incredibly smooth finish of Timken bearings reduce friction to a minimum. They hold shafts and housings concentric, making closures more effective. Lubricant stays in—dirt and moisture stay out.

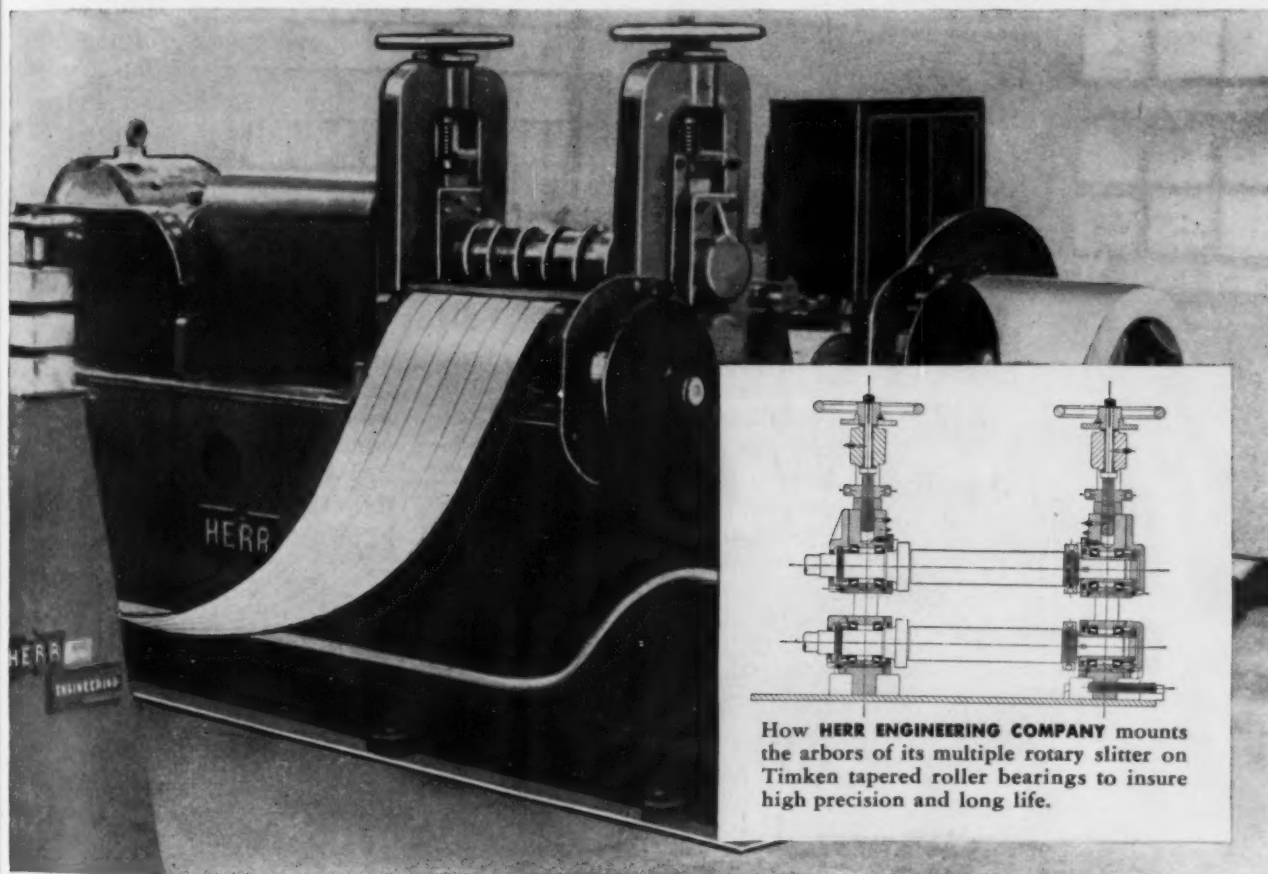
Timken bearings normally last the life of the machine. They're precision manufactured, engineered for the job

and made of special analysis Timken fine alloy steel.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Specify them in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: S. Thomas, Ontario. Cable address: "TIMROSCO."



This symbol on a product means its bearings are the best.



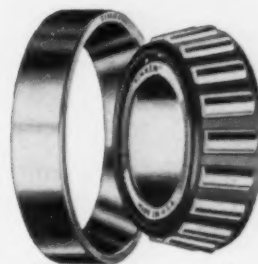
How HERR ENGINEERING COMPANY mounts the arbors of its multiple rotary slitter on Timken tapered roller bearings to insure high precision and long life.

## MAGNIFYING GLASS INSPECTION OF EVERY ROLLER!



Every one of the over one billion Timken bearing rollers produced every year is inspected with powerful magnifying glasses to detect surface flaws. It's just one example of how the Timken Company insures uniform high quality.

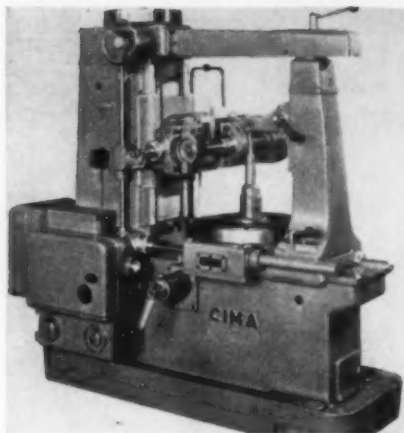
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TRADE MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**



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# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 105 or 106.

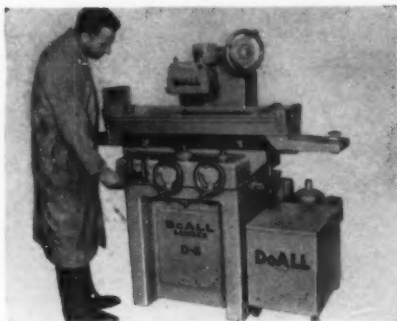


## Universal gear hobber features climb-cutting

The Cima gear hobbing machine for spur, spiral and worm gears is designed for climb-cutting; the hob starts cutting on the bottom of the gear and is fed upward. The chip produced is thick on top and thin on the bottom. Since there is less material to be removed at the bottom of the cut, a better finish on the tooth flanks is produced, permitting increase of feed per revolution of the hob, without impairing the finish or accuracy of the teeth. Differential mechanism simplifies

cutting spiral gears. Cutter head is arranged for tangential feeding for generating multiple start worm gears with greater accuracy and full contact without ridges on the tooth flanks. Worm gears may be generated by means of fly cutters. Single or multiple thread worms can also be produced on a production basis, the worm blank placed on the hob arbor and a gear generator cutter on the work arbor. *George Scherr Co., Inc.*

For more data circle No. 18 on postcard, p. 105.



## Surface grinder expedites tool room operations

Design and construction of a precision toolroom surface grinder is aimed at centralizing complete control over dimensional size and protection of the workpiece from detrimental grinding heat. The operator can grind to the graduations of the controls on the surface grinder. This means that the

grinder does the work of grinding to dimension according to feed-wheel calibrations set by the operator. During the grinding operation the point of cut, as well as the entire workpiece, is kept cool by one of three cooling methods. *DoAll Co.*

For more data circle No. 19 on postcard, p. 105.

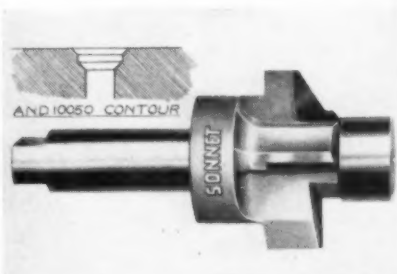


## Radial arm drills designed for aircraft industry

Double spindle models of radial arm drills are particularly adaptable to the production requirements of the aircraft industry. Type DS machine is available in two sizes with three models of each. All six have a fixed center-to-center distance of 6 in. between drill spindles, and

identical specifications include: dual spindle speeds of 5000 and 8000 rpm, vertical spindle travel of 4½ in., vertical turret post adjustment of 6 in., drill chuck capacity of 0-¾ in. Radial reach is 30 and 71 in. *Ekstrom, Carlson & Co.*

For more data circle No. 20 on postcard, p. 105.



## Port contour produced in one operation

A standard carbide-tipped tool has been developed to produce the Army and Navy AND-10050 port or connecting holes for hydraulic valves, fittings, etc. The tool has four flutes with each flute performing an operation, producing the form shown in the cutaway illustration.

During the cutting cycle, the tool is piloted in the minor thread diameter to insure concentricity. Carbide tip gives long life and good finish in both ferrous and nonferrous material. *Sonnet Supply Co.*

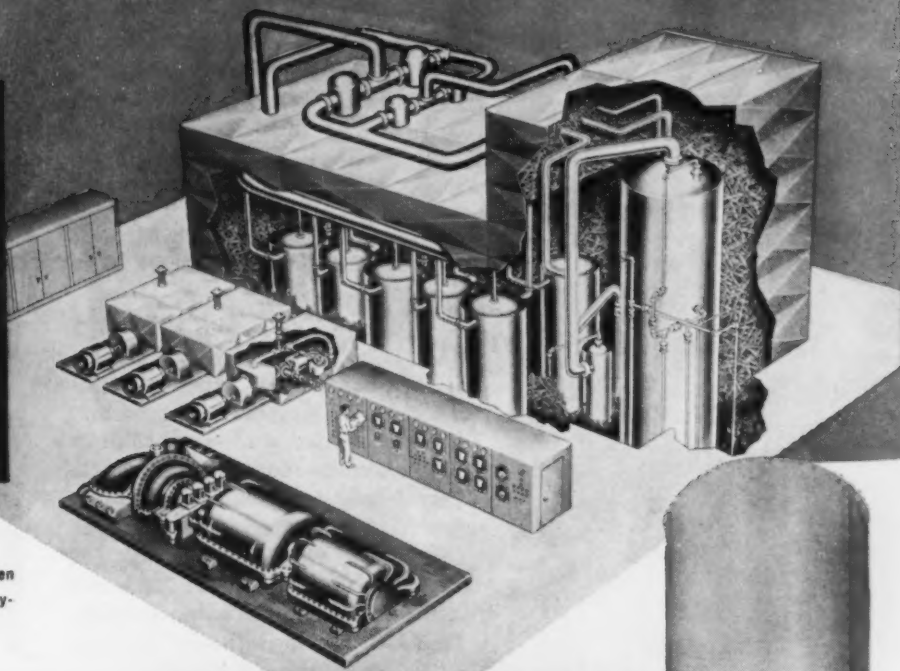
For more data circle No. 21 on postcard, p. 105.

Turn Page

# Use the free air to make your own LOW COST OXYGEN and NITROGEN

## 2-in-1 Tonnage GENERATORS

Standard models with  
oxygen capacities to  
1000 TONS PER DAY  
Nitrogen capacities larger



A typical Air Products Tonnage Oxygen-Nitrogen Generator in operation since February, 1951. Oxygen capacity, 450 tons per day.

**AIR PRODUCTS TONNAGE GENERATORS** for oxygen, nitrogen *unlimited!* Standard models or specially designed. High or low pressure cycles according to requirements. Generators for production of oxygen and nitrogen, gas or liquid, in virtually *any* quantity, of *any* purity and at *any* pressure.

**AIR PRODUCTS HIGH-PURITY GENERATORS** slash oxygen costs and inert gas costs. Make *both* with *one* generator—produce super high-purity oxygen and nitrogen *simultaneously* or individually. Make *what* you want *when* you want it: compressed oxygen, high or low pressure nitrogen, liquid oxygen, liquid nitrogen.

What are your requirements? Write to  
**AIR PRODUCTS, INCORPORATED**  
Dept. I, Box 538, Allentown, Pa.

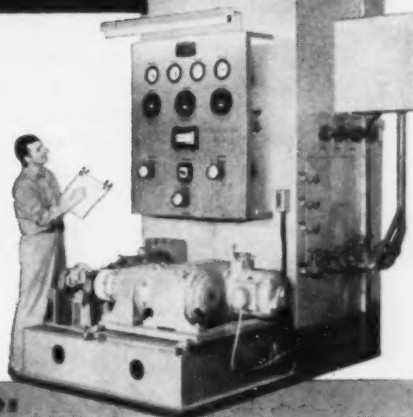
## 2-in-1 High-Purity GENERATORS

**OXYGEN** to 99.9% Purity  
Capacities to 12,000 cubic feet per hour

**NITROGEN** to 99.99% Purity  
Capacities to 36,000 cubic feet per hour

# Air Products INCORPORATED OXYGEN-NITROGEN GENERATORS

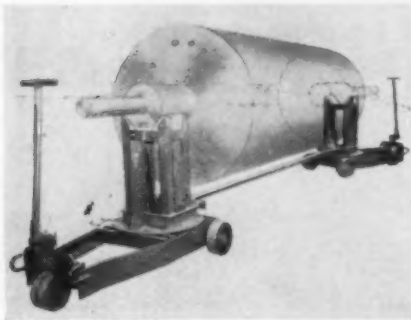
Specialists in Gas Separation by Low-Temperature Processes



April 9, 1953

## New Equipment

Continued

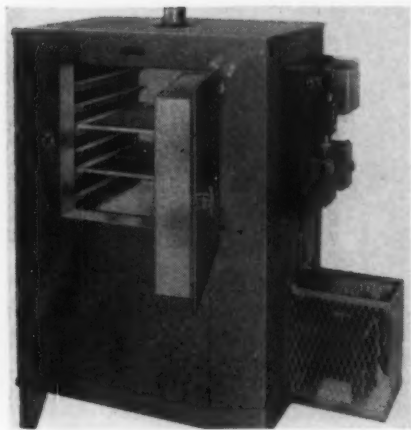


### Floor truck designed for handling beams or rolls

The many possibilities of adapting floor trucks to special purposes is shown by this unit which was made for heavy duty loads up to 15,000 lb and for operations where the movement of heavy and long rolls or beams is involved. Hard wood V blocks are mounted on dual steel turntables which are connected at

their base by a tubular member so that load is kept in line for straight and corner traction. Maximum maneuverability is the result. By varying length of tubular connecting rod, turntable dollies can accommodate various length rolls or beams. *Lewis-Shepard.*

For more data circle No. 22 on postcard, p. 105.



### Cabinet ovens offer controlled production

New design and engineering of a line of cabinet ovens make possible closer control of uniform temperature, better performance and greater economy of operation. A high pressure motor driven blower propels heated air in a definite air-flow pattern through the work chamber. This prevents any disturbance due to radiant heat and assures temperature uniformity. Features include: Indicating tem-

perature control; high volume adjustable air-flow; high and low heat switch for close control and quick recovery; Inconel-sheathed heating elements. Shell construction is 18 and 20 gage oven steel reinforced and welded. Insulation is Fiberglas. Available in horizontal or vertical flow. Temperatures to 650°F and 850°F for 220 or 440 volt operation. *Grieve-Hendry Co., Inc.*

For more data circle No. 23 on postcard, p. 105.

## MAY-FRAN AUTOMATIC SCRAP HANDLING SYSTEM

### Solves scrap disposal problem for large automotive manufacturer

World's largest automatic scrap handling system engineered by MAY-FRAN can handle one million pounds of scrap per day . . . one man controls all operations! Twenty conveyors collect scrap from presses . . . transfer it to the 1145-foot main conveyors . . . then scrap is conveyed to baler house where it is compressed into bales and discharged into automatically indexed freight cars on siding. Entire system is operated from a single control station.



Write today for illustrated catalog.



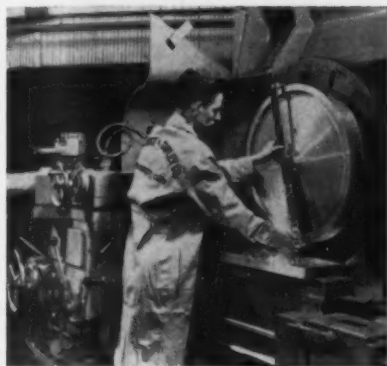


## Machine handles complicated profile milling

New boring and facing machine handles complicated, irregular profile milling and boring of aluminum, magnesium castings and forgings, cast and rolled armor plate. It is equipped with duplicator equipment with templates, and applicable to difficult profile machining necessary in the manufacture of aircraft and armored vehicle parts. The machine features a spindle

housing as a motor powered unit which moves directly into the work face. It is stated this makes work more accurate and gives more power and rigidity to the cutting tool. The machine is a complete package to be placed in service when it leaves the factory; includes work holding fixtures, tooling, templates. *Forney's, Inc.*

For more data circle No. 24 on postcard, p. 105.



## Large dimension inspection with gage blocks

Heavy duty gage blocks and T lathe team up on jet parts. The Lodge & Shipley lathe permits easy accessibility to the work and provides sufficient clearance to turn work of comparatively large diameter and short lengths such as are found among jet engine parts. Linear inspection of these parts can be made without removing the work from the machine. Oversize gage blocks

are usually employed such as Webber heavy duty blocks. They are held together with eccentric clamps, providing a rigid build up without excessive pressure. Accuracy of  $\pm 0.000005$  in. is maintained over the entire assembly. Sets measure any workpiece irrespective of size. *Webber Gage Co.*

For more data circle No. 25 on postcard, p. 105.

**Turn Page**



## Plant-wide system or Single unit

Whether you need a complete plant-wide system or a single scrap handling unit, **MAY-FRAN** can meet your requirements. Conveyors of any size can be supplied using the unique **MAY-FRAN** hinged-steel belting. Speed-up production . . . eliminate manual handling . . . reduce scrap handling costs with a **MAY-FRAN** system!



# MAY-FRAN

## ENGINEERING, INCORPORATED

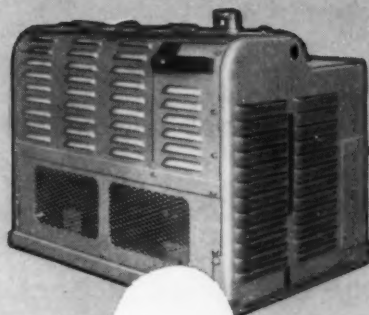
1698 CLARKSTONE ROAD

CLEVELAND 12, OHIO

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**GAS-ELECTRIC**

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Power Units  
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Now you can select either gas-electric or Diesel-electric Ready-Power for any size or make of electric truck. GAS-ELECTRIC Models are for the tough materials handling jobs... DIESEL-ELECTRIC Models master the "impossible" jobs that keep trucks going day and night, year after year. Ready-Power continuous-duty drive operates electric trucks at the lowest known costs per ton mile! Write us for additional information.



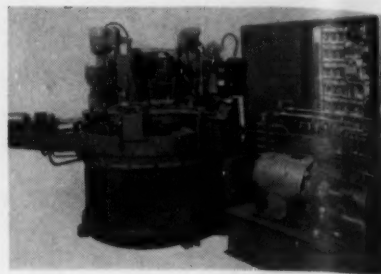
Booth 1404 & 1501

**The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.**

*Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks*

## **New Equipment**

*Continued*



### **Oil pump assembly**

A semi-automatic, hopper fed, 8-station, oil pump assembly machine is actuated by a combination hydraulic and mechanical system. In one hour and at 80 pct efficiency, 280 oil pumps can be assembled. There are three simple manual operations, each requiring one man. *Douglas Tool Co.*

For more data circle No. 26 on postcard, p. 106.

### **Portable oscillograph**

Six channels of instantaneous electric phenomena, or mechanical phenomena that can be converted to electric phenomena in the frequency range of dc to 100 cycles per sec can be recorded on a new portable oscillograph. A large window in the top of the instrument



permits viewing the chart as information is being recorded. Controls provide starting, stopping and selection of chart speeds of 5, 25, and 125 mm per sec. A remote control box is provided, permitting the operator to start and stop the chart drive from remote locations. *Brush Electronics Co.*

For more data circle No. 27 on postcard, p. 106.

**Turn Page**

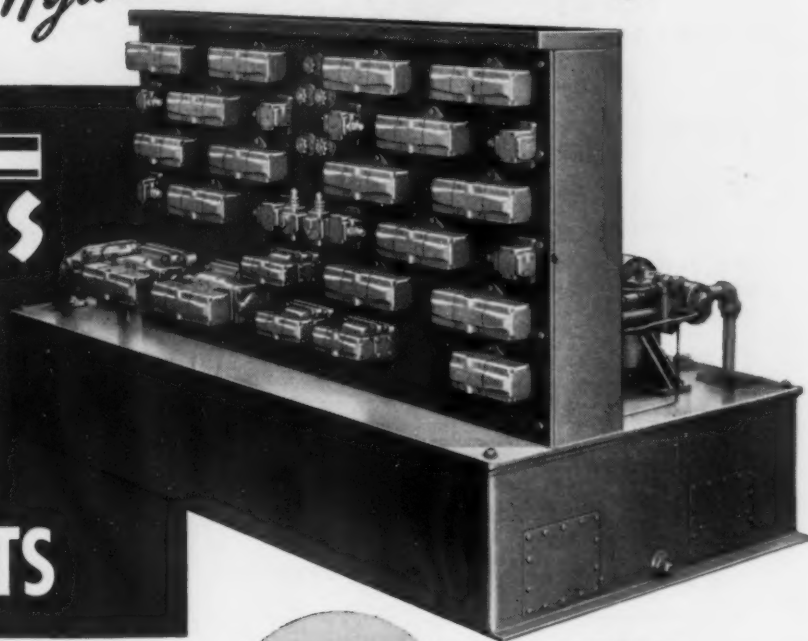
You Wouldn't Buy  
a Washing Machine  
*This Way*



*Then Why Buy Hydraulics Piecemeal?*

# VICKERS

## Custom-Built HYDRAULIC POWER UNITS



You would never go to the trouble of buying automatic washing machine parts and assembling them yourself. It would take a lot of time and patience and trouble. For one thing the maker could not risk guaranteeing the finished job. You buy a washing machine as a unit, and want the undivided responsibility of the manufacturer.

Then why buy hydraulics piecemeal when there are so many advantages in a Vickers Custom Built Power Unit? It is built to meet your individual requirements, in a compact, neat, self-contained "package." It includes all necessary pumps, valves, intermediate piping, oil reservoir, motors, controls etc. as well as all hydraulic accessories (oil filters, air cleaners, oil level gauges, fittings etc.). Hydraulic connections are grouped in a convenient manifold.

Hydraulic design is simplified and improved, and you save substantially on installation and maintenance cost. Vickers takes undivided responsibility for the entire hydraulic system and you get the benefit of Vickers skill and experience. These advantages are important to both the machine builder and his customer.

Ask the nearest Vickers factory-trained application engineer to send you new Bulletin 52-45 or to make a personal call.

Improve  
and  
Simplify  
Hydraulic  
Design

Reduce  
Installation  
and  
Maintenance  
Costs

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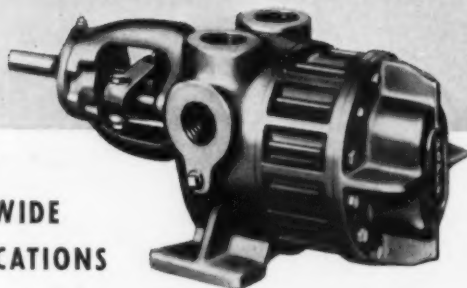
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

April 9, 1953

115

# Install **ROPER** ROTARY PUMPS

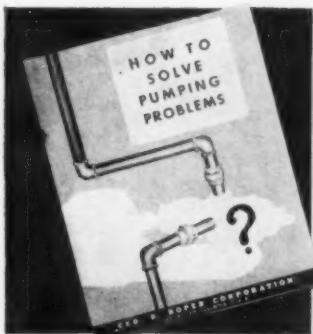
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PUMP

MODELS FOR AN  
EXCEPTIONALLY WIDE  
RANGE OF APPLICATIONS

SERIES	TYPICAL USES	PRESSURES	SIZES
<b>3600</b>	All Petroleum Handling Grease Compounding Oil Circulating General Transfer	to 60 P.S.I.	40-300 G.P.M.
<b>F</b>	Pressure Lubrication Hydraulic Power Fuel Transfer Lube Oil Transfer	to 300 P.S.I.	1-300 G.P.M.
<b>K</b>	Pressure Lubrication Hydraulic Service Industrial Oil Burner Fuel Supply	to 150 P.S.I.	¼-50 G.P.M.
<b>H</b>	Hydraulic Power Test Equipment Pressure Lubrication High Pressure Coolant	to 1000 P.S.I.	5-75 G.P.M.



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BOOKLET NOW READY FOR  
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A valuable guide covering important fundamentals of estimating requirements of the average pumping job. It includes tables, charts, sample problems, and other pertinent data. SEND COUPON BELOW.

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Please Send Booklet—"How to Solve Pumping Problems"

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**ROPER**  
*Rotary Pumps*

## New Equipment

Continued



### Spray painting booth

By using a combination of water washing and centrifugal force, new Dynaprecipitor water wash spray painting booth is easy to clean and meets health and safety requirements. Overspray and fumes are drawn through the booth by a powerful exhaust fan. The air travels a winding route designed to trap all air borne paint particles before they reach the fan or the out-of-doors. Thorough water washing takes place at four locations. Paint particles are flushed into a collection pan for easy reclamation or removal. *Binks Mfg. Co.*

For more data circle No. 28 on postcard, p. 165.

### Vibration pads

Keldur vibration isolation pads feature both elasticity and damping qualities in proper proportion. Keldur is easy to install, has loading weight of 6 psi. It is impervious to the effects of cutting oil, gasoline and diesel fuels. Available in sheets 36 in. square in ¼, ⅜, and ½ in. thickness. *Hobsite Products Co.*

For more data circle No. 29 on postcard, p. 165.

### Hour log

A continuous record of running time for industrial machines operating on ac current is possible using the Engler Hour Log. Housed in a rugged steel case which is dust proof, the instrument has interior lighting with an off and on switch. It keeps an accurate record of downtime, making it suitable for time study. Readings can be taken at a glance. *Engler Instrument Co.*

For more data circle No. 30 on postcard, p. 165.

## Plastic coated gloves

To safeguard the hands of workers who do dirty jobs and handle harsh materials, a tough, colorful new plastic-coated work glove has been developed. Called Dynagluvs, the product is completely liquid-proof and high resistant to abrasion and abuse. A seamless wing thumb provides extra safety, while a natural molded curve contributes to comfort. Dynagluvs are made in knitted wrist, band top and gauntlet styles. The plastic coating is satin-finished emerald green. Granet Corp.

For more data circle No. 31 on postcard, p. 105.

## Gas fired heaters

For commercial and industrial companies who need supplemental heating in decentralized buildings and small office areas, a line of suspended gas fired units are suitable for natural, manufactured, mixed, liquid petroleum, sewage or coke-oven gas. Input capacities range from 85,000 to 215,000 Btu per hr. Model D unit heater comes with a standard fan; Model DB with



squirrel-cage blower for short duct runs. Model DD is designed as a heating unit to be built directly into air-conditioning duct systems. The cast-iron bunsen type burner assembly can be removed quickly for easy servicing and cleaning. The drawer frame slides out with the mounted burners and all controls, making them easily accessible. Heaters carry A.G.A. approval; are listed by Underwriters Laboratories. Dravo Corp.

For more data circle No. 32 on postcard, p. 105.

Turn Page

## LOW COST IRIDITE® FINISHES

for zinc,  
cadmium, aluminum  
and cuprous  
metals

provide  
corrosion resistance  
paint base  
choice of  
appearance

And they are easy to  
apply! Just a simple chemical dip  
for only a few seconds produces the coating.

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combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

**WHY NOT TEST IRIDITE ON YOUR PRODUCTS?** Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

Iridite is approved under government specifications.

**ALLIED RESEARCH PRODUCTS**  
INCORPORATED

4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

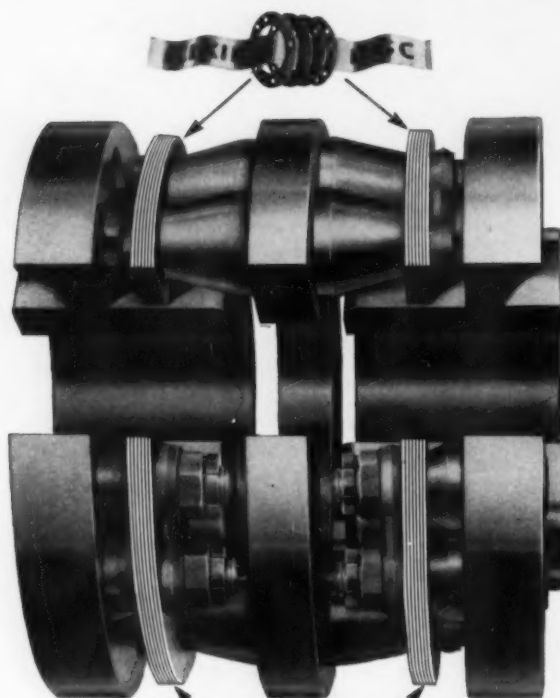
Manufacturers of Iridite Finishes  
for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Brighteners.  
West Coast Branch: L. H. BISHOP COMPANY



# AVOID COSTLY SHUT-DOWNS!

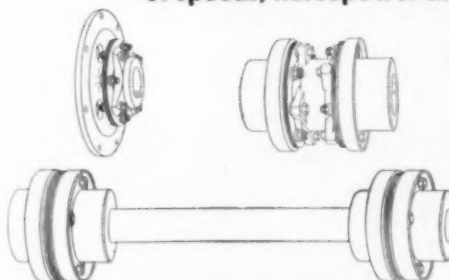
Specify THOMAS Flexible Couplings for Power Transmission

DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



**Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.**

**Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.**



THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF  
FLEXIBLE COUPLINGS ONLY  
FOR OVER 35 YEARS

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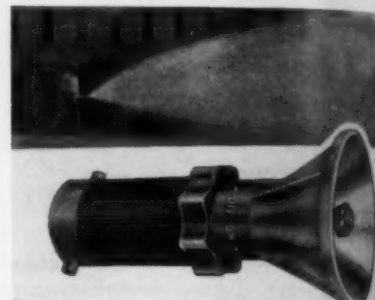
**THOMAS FLEXIBLE COUPLING COMPANY**  
WARREN, PENNSYLVANIA, U.S.A.

## New Equipment

Continued

### Spiral fog

Two models of this fog nozzle with spiral fog tip fit 1½ in. hose. Better reach and coverage, and better atomization at lower pressures are advantages of these non-clogging nozzles. Turning the handle changes the nozzle from off to fog, then to straight stream. A special

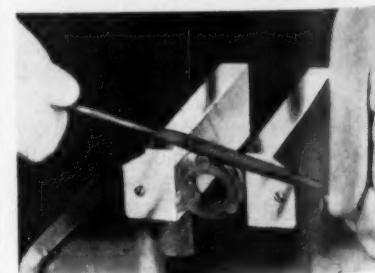


narrow-angle fog tip provides extra long reach with excellent atomization. Nozzles are polished stainless steel with chrome plated brass parts. Metal-to-metal shut-off is positive. Shut-off is gradual enough to eliminate danger of back pressure damage to hose or pump. *Beta Fog Nozzle Inc.*

For more data circle No. 33 on postcard, p. 105.

### Vise jaw face plates

Nava-Mar vise jaw face plates protect soft and finished materials from being marred by the vise jaws. They are made in ¼ in. sizes to fit any standard make of vise up to 6 in. Fastened by a set screw,



they become an integral part of the vise jaw, yet can be removed by a turn of a screwdriver. Made in bronze, aluminum, and fiber or babbitt facings bonded to aluminum bodies. *Kenimar Corp.*

For more data circle No. 34 on postcard, p. 105.

Turn Page

## What's YOUR Problem?



**J. E. Weston**, of Standard Oil's Kansas City office, is the lubrication specialist who helped this metalworking company solve a "finish" problem on the honing operation described at the left.

Like all of the many Standard lubrication specialists located throughout the Midwest, he has the experience and special training necessary to analyze his customer's needs. Like all of Standard's lubrication specialists, he is close at hand and therefore able to give his customer on-the-spot assistance.

You can reach the lubrication specialist serving your area of the Midwest by phoning your local Standard Oil office. He will be glad to discuss your operations and with no obligation to you. There may be savings for you in the benefits offered by such outstanding cutting oils as:

**STANICOOL HD Soluble Oil** — Because it contains additional compounding, this heavy-duty soluble oil possesses not only the cooling ability of an emulsion but also the ability to give better tool life and finer finishes than can be obtained with a conventional soluble oil.

**STANOSTAMP Compounds** — Here are three established products for stamping or heavy drawing operations of either low-carbon or alloy steels. Water can be added to these paste compounds to provide the most economical applications. STANOSTAMPS offer maximum protection for dies and work. These compounds can be removed readily in conventional washing equipment.



(Indiana)

## Better honing results from start to finish with...

**STANICUT**  
TRADE MARK  
**Cutting Oil**

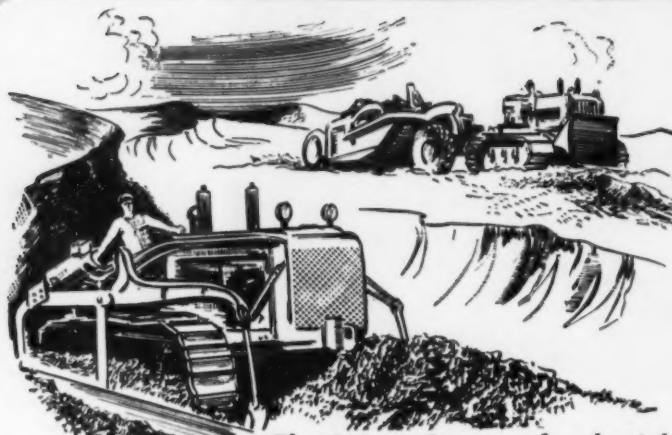
consumption has been reduced.

Whatever your machining operation, the Standard Oil cutting oil specialist serving your area of the Midwest has the cutting oil that will meet your needs. He has the experience and special training necessary to help you get better cutting oil results. How you can get his help easily and quickly is explained at the right. Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

A midwest metalworking company—rebuilder of a popular automobile engine—had a cutting oil problem. On the honing operation, shown above, the finish obtained on engine cylinders did not measure up to the high quality desired by that firm. Various honing oils were tried without measurable improvements. The problem was put to a Standard Oil cutting oil specialist. He recommended the use of STANICUT Oil No. 62 FC, a light-colored, light-bodied cutting oil that contains the correct proportion of extreme-pressure and friction-reducing ingredients. From every angle, STANICUT has proved ideal for the job. The desired finish has been obtained on the cylinders. Tool life has been greatly increased. Oil

**STANDARD OIL COMPANY**

# For **DEPENDABILITY** **IN CONSTRUCTION** **EQUIPMENT**



## The Correct Fastener for the Job

For over 38 years Erie has manufactured bolts and studs to the specifications of Diesel Engine builders. This specialized experience gained in working with leading Diesel designing engineers assures you of getting the exact materials and the precise tolerance in bolting desired for your Diesel. Send us your specifications for Diesel Connecting Rod Bolts, Cylinder Head Studs, and other special bolting.



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STUDS • BOLTS • NUTS  
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CARBON • BRONZE

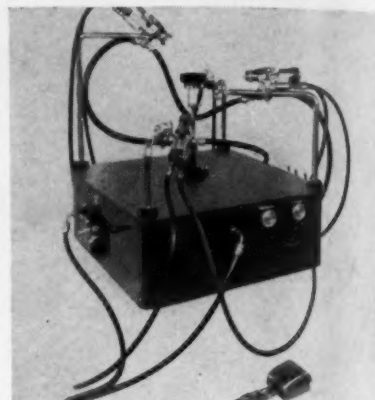
*Representatives in Principal Cities.*

## New Equipment

*Continued*

### Spray painter

Automatic, single-spindle painting machine for shorter runs is produced as portable packaged equipment which can be used in most standard spray exhaust booths. One dial regulates the spindle speed from 100 to 400 rpm; a second dial

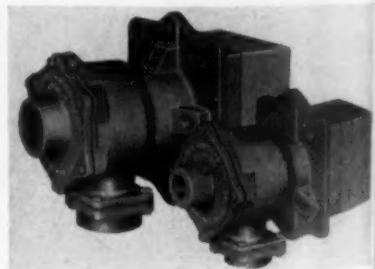


controls the length of time the spray guns operate. Spindle and guns go into action at the touch of a foot pedal; stop automatically as predetermined by the dial settings. Provision is made for mounting up to four guns to cover the work. Work-holder can serve as masking device. *Conforming Matrix Corp.*

For more data circle No. 35 on postcard, p. 165.

### Versatile gas burner

Installation of a new, nozzle mixing type gas burner is easy for the customer. It is offered in five sizes, and shipped with mounting and tile already assembled in an integral unit. Burners have a high effective turndown, making them suitable



for installation on multiple purpose furnaces. A furnace equipped with these burners can be operated at temperatures from 400°F up through temperatures used for annealing and hardening processes, 1800°F. *North American Mfg. Co.*

For more data circle No. 36 on postcard, p. 165.

# The Iron Age

## SALUTES

Allison R. Maxwell, Jr.

His enthusiasm and ability to get along with others have helped his company through its growing pains.



ALLISON MAXWELL may never write a book on *How to be Human Though Successful*, but he could. Among the brass of the steel industry, Allison ranks high in ability to get along with people.

As vice-president—sales, Pittsburgh Steel Co., he has had his share of things to worry about—even in today's market. But at his busiest, he'll take time to talk shop with someone who needs information, but hasn't the least interest in buying steel.

At 38, Allison is enthusiastic, full of ideas and anxious to convert them into live projects. He needs all this—and more. He has been walking a sales tight-rope when his company's \$60-million expansion program interfered with production. It's been feast in some products, famine in others.

Through it all Allison has kept his balance—and the customers. Smoother sailing is ahead. The "new" Pittsburgh Steel will be a reality this year, producing hot and cold rolled sheets for the first time, with a generally better product balance.

A Princeton graduate, Allison joined Pittsburgh Steel in 1935. After 3 years in the Monessen and Allenport mills, he moved to Pittsburgh district sales. Made general sales manager in 1949, he was elected vice-president last year.

Married, he's the father of three boys and a girl. Hobbies include golf and fishing, when he gets a chance.

# STANDARDS and SPECIALS by the Millions

**THE FERRY CAP & SET SCREW CO.**  
2155 SCRANTON ROAD • • • CLEVELAND 13, OHIO



## "SHINYHEADS"

**America's Best Looking Cap Screw**  
Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.



## "LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.



## FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.



## "SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.



## CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.



## FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.



## "HI-CARBS"

**Heat Treated Black Satin Finish**  
Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.



## SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.



## FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.



## ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.



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Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.



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# The Iron Age

## INTRODUCES

Walter H. Boddle, elected president and general manager, UNION DIE CASTING CO., LTD., Los Angeles; and J. A. Campbell, becomes vice-president.

Rudolph A. Langer, elected president, AMERICAN METAL MARKET CO.

Edwin H. Walker, appointed president and general manager, MCKINNON INDUSTRIES, LTD., subsidiary of General Motors, St. Catharines, Ont.

Walter V. Peters, elected president, BYRNE METAL PRODUCTS, INC., Detroit.

Jack G. Allen, becomes vice-president, THE BINGHAM-HERBRAND CORP., Fremont, Ohio, and general sales manager of the Herbrand Div.

H. Earl Benson, named administrative assistant, WHEELER ASSOCIATES, INC., Cleveland; Clarence Hoke, appointed midwest manager; Chicago office; and Robert D. Havens, becomes client relations manager.

Herbert F. Boettler, elected to board of directors, LACLEDE - CHRISTY CO., St. Louis.

Charles B. Tillson, Jr., appointed superintendent of Crucible Mine, CRUCIBLE STEEL CO. OF AMERICA, Crucible, Pa. He succeeds T. P. Latta, who has retired.

Alfred H. Busch, elected secretary, STEWART - WARNER, CORP. Chicago.

James R. Bowers, becomes a draftsman, Engineering Dept., HOOKER ELECTROCHEMICAL CO.

Harry Cole, appointed general superintendent, Rail Transportation Dept., TENNESSEE COAL & IRON DIV., of U. S. Steel at Birmingham.

Dr. Harold T. Clark, named assistant director of research, JONES & LAUGHLIN STEEL CORP., Pittsburgh; and George H. Enzian, becomes manager of metallurgical research.

Donald A. Davenport, becomes chief engineer, ASSOCIATED RESEARCH, INC., Chicago; and Paul Wade, named purchasing agent.

James J. Reynolds, appointed vice-president in charge of industrial relations, AMERICAN LOCOMOTIVE CO., New York.

Julian D. Dickerson, appointed chief metallurgist, Midland Works, CRUCIBLE STEEL CO. OF AMERICA.

Edward J. Hrdlicka, appointed manager, Hydreco Div., THE NEW YORK AIR BRAKE CO., Cleveland.

Ben F. Curtis, appointed chief geologist, TEXAS EASTERN PRODUCTION CORP., Houston, Texas.

George W. Bruce, appointed works manager, Claymont Plant, COLORADO FUEL & IRON CORP., Claymont, Del.; K. B. Stuart, appointed general manager, Coke & Chemical Sales; M. P. Drummond, appointed manager, of Coke Sales; and F. P. Jasper, becomes manager of Chemical Sales.

John McGowan, becomes assistant to the New York district manager, SCAIFE CO.

Joseph J. Bozis, appointed assistant to the sales manager, Feed Phosphate Dept., INTERNATIONAL MINERALS & CHEMICAL CORP., Phosphate Div., Chicago.

Howard C. Holmes, appointed assistant general salesmanager, KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif.



EADS JOHNSON, JR., becomes president, Southern Wheel Div., American Brake Shoe Co.



ALVIN A. SHUMANN, elected president of Lehigh Foundries, Inc., and its affiliate Lehigh Mfg. Co., Easton, Pa.



ROGER E. BREMER, appointed director of purchasing, Packard Motor Car Co., Detroit.

## Personnel

Continued

Harry L. Quinn, secretary, will also become general manager, LEBANON STEEL FOUNDRY, Lebanon, Pa.; T. S. Quinn, Jr., becomes plant manager; Leroy G. Miller, becomes chief engineer in charge of Product; and John M. Quinn, assumes responsibility for all foundry operations.

Richard K. Hulett, promoted to assistant industrial sales manager, IRON FIREMAN MFG. CO.

Paul D. McCullough, Jr., appointed sales manager, Electro-Alloys Div., AMERICAN BRAKE SHOE CO.

L. W. Long, named manager of a new department, Switchgear Dept., ALLIS-CHALMERS MFG. CO., Milwaukee.

Dr. Elden D. Haller, appointed Eastern sales manager, BECKMAN INSTRUMENTS, INC., South Pasadena, Calif.

James W. Johnson, becomes supervisor of training in the industrial Relations Dept., PITTSBURGH COKE & CHEMICAL CO., Pittsburgh.

William H. Healy, sales manager, De Laval Turbine Div., appointed to the additional post of sales manager, Blower and Compressor Div., DE LAVAL STEAM TURBINE CO.

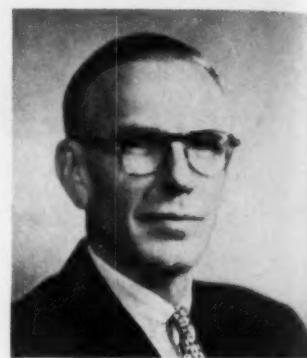
George E. Miller, becomes sales manager, OSBORN MFG. CO., Cleveland; James W. Stuart, becomes assistant sales manager, Cleveland; and J. Doyle Robbins, becomes assistant to the vice-president.

George W. Slomin, joins ROHR AIRCRAFT CO., Chula Vista, Calif., in the Research & Development Laboratories.

Frank Reha, named sales engineer, Michigan territory, UDYLITE CORP.; and Louis J. Minbiole, becomes assistant sales manager, Detroit.

Samuel G. Wagner, appointed assistant to the manager of the Sheet & Strip Div., INLAND STEEL CO.; and Richard D. Browne, becomes assistant manager of the Order Div.

J. C. Scott, appointed new product sales manager, FRUEHAUF TRAILER CO.



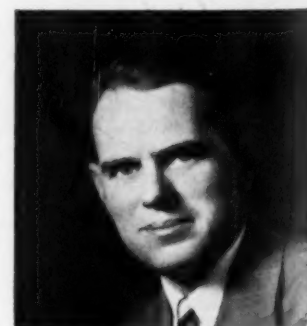
M. MERLE HARROD, elected president, The Wapakoneta Machine Co., Wapakoneta, Ohio.



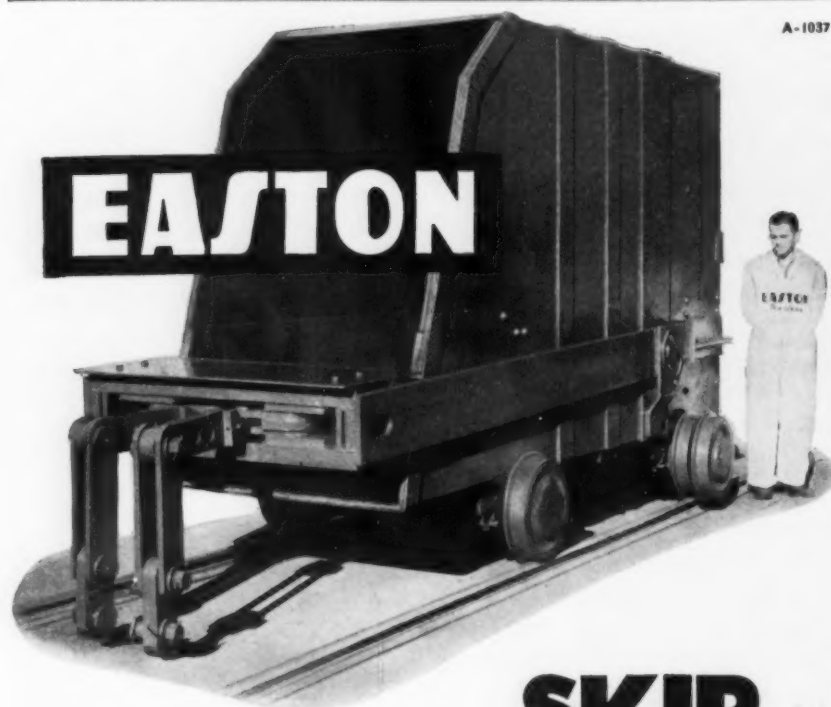
DONALD C. LILLIS, elected chairman of the board, National Can Corp., New York.



OLIVER E. RODGERS, appointed chief engineer, Jet Engine Div., Packard Motor Car Co.



DURANDO MILLER, JR., promoted to assistant technical manager, The Permutit Co., New York.



Above: For charging blast furnace.

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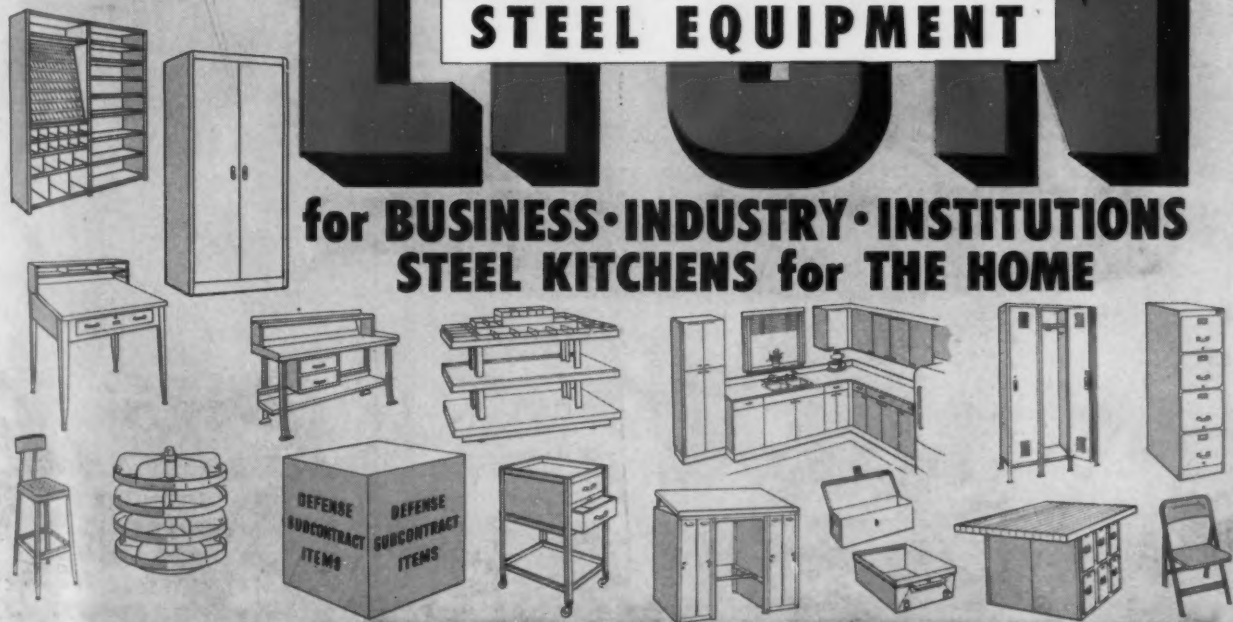
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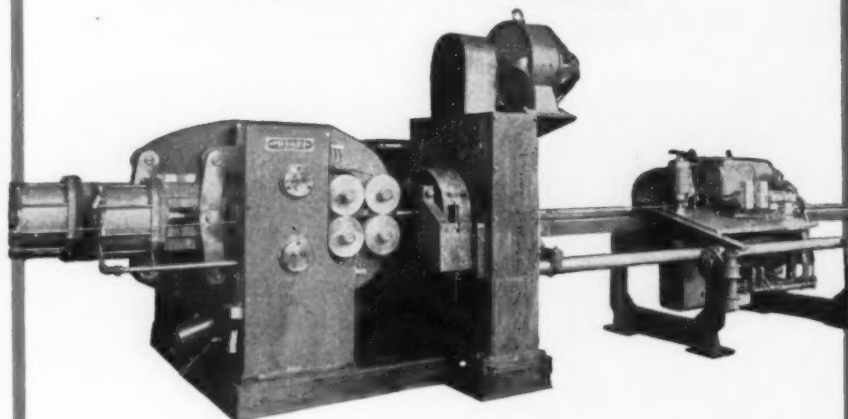
- Shelving
- Kitchen Cabinets
- Tool Taters
- Economy Locker Racks
- Display Equipment
- Filing Cabinets
- Service Carts
- Tool Stands
- Lockers
- Cabinet Benches
- Bar Racks
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- Flat Drawer Files
- Folding Chairs
- Sorting Files
- Shop Boxes
- Stools
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FOR BARS  $\frac{1}{4}$ " to 6" DIAMETER



- ▶ The unsurpassed production speeds of the RFPD Turner using carbide cutting tools—up to 12 ft. per minute—average from 3 to 4 times that of conventional turners by actual comparison.
- ▶ Material turned on this machine can be sold directly from the machine for "as turned" stock, put through the Medart two-roll rotary straightening, sizing and polishing machines for "turned and polished" stock, or given one pass through a centerless grinder for "ground" stock.
- ▶ The RFPD turning gives 100% material recovery with short, easy-to-handle chips.
- ▶ Direct-drive cutterhead, through single V-belt drive, is a single compact unit designed for either brazed tip or mechanically held carbide tools.
- ▶ Controls provide fully automatic push-button operation through entire cycle, and supplementary manual operation for setup. Both speeds and feeds are infinitely variable.

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*Write For Illustrated Brochure*

**THE MEDART COMPANY** 3535 De Kalb Street  
St. Louis 18, Mo.

**Personnel**

*Continued*

**OBITUARIES**

J. Ray Travis, president and founder, Eaton Metal Products Co., Denver, after an illness of several months.

E. B. W. Pfischner, 80, president, The E. L. Lippert Saw Co., Millvale, Pa., in his home recently.

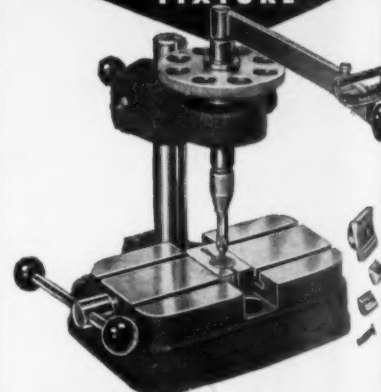
L. H. Buhs, general sales manager, Plan-O-Mill Corp., Hazel Park, Mich., recently.

Bertram H. Lawrence, 70, retired vice-president—Engineering, U. S. Steel Corp., at his home in Cleveland recently.

Frederick Donald Schreiber, 62, manager of the coal chemicals division, Pittsburgh Coke & Chemical Co., of a heart attack while vacationing in Ocala, Fla.

A. A. Aponick, 41, sales representative, Park Chemical Co., Detroit, in Cincinnati recently.

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TORQUE TESTING  
FIXTURE**

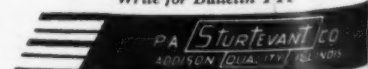


**FOR TESTING** Screws, thread-cutting and thread-forming screws—all types of threaded fasteners; threaded parts and threaded connections.

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## Which Gray Irons FOR LARGE VOLUME PRODUCTION?

♦ Tool-life tests show machinability of high-phosphorous gray irons compares favorably with low-phos irons . . . Steadite has no adverse effect on machinability.

♦ In alloyed irons, the presence of nickel has a beneficial effect on machining properties . . . The carbide-stabilizing effect of chromium sharply reduces tool life.

♦ Tool failure was carefully set by tool-wear measurements run at various speeds . . . Test speeds varied from 185 to 512 sfpm.



By E. A. Loria  
Metallurgist  
Research & Development Dept.  
The Carborundum Co.  
Niagara Falls, N. Y.

♦ **MACHINABILITY RESULTS** on alloy cast irons have produced dependable data on the most widely used irons. These data are of particular importance to the automotive industry and other large-volume casting consumers as well as the producers of high-test iron.

In cast iron, phosphorous combines with iron to form steadite containing about 10 pct P. A phosphorous content of 0.50 pct indicates a steadite content of about 5 pct. Since this micro constituent is comparatively hard it might reasonably be expected to impair machining properties, especially tool life. For the series of high-phosphorous irons tested steadite did not have an adverse effect on machinability.

Producers of high-quality test irons receive many orders for castings required to withstand various types of pressures. To comply with these requirements, molybdenum-chromium additions are made to increase strength and structural soundness. Nickel is also used in combination with either or both of these elements to achieve desired properties. Machinability tests on cast-iron alloys revealed, as expected, that they were less machinable than unalloyed irons.

The presence of nickel, however, was found to increase machinability.

Research along this line was a natural extension of previous tests made in the same manner on automotive cast irons with low-phosphorous content. Commercial machining of cast iron was closely simulated by cutting the surface of cast-

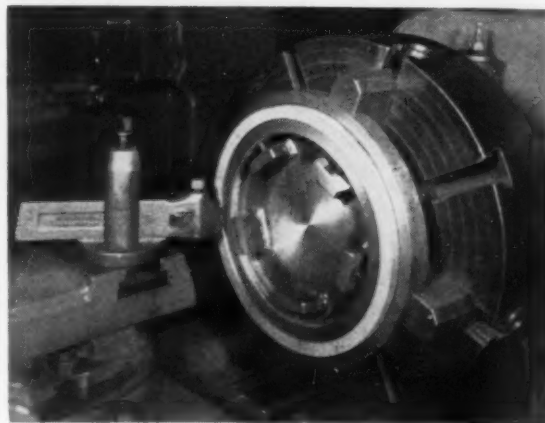


FIG. 1—Tool life machinability tests on gray-iron rings closely simulated commercial machining.

## "Machinability of high phos gray irons compared favorably with comparable low phos irons . . ."

iron rings on a lathe, see Fig. 1. Spinning of the test specimens permitted high machining speeds and the ring design offered adequate material for testing. Single-point Carboloy grade 44A tools were used and ground to the same geometry. The roughness of the ground flank and top surfaces was held within 6 to 9 microinches. Flank wear on the tool was measured with a microscope giving a magnification of 100 X.

Initial tests were made on the as-cast surface of the rings at 185, 315 and 512 sfpm. They were run alternately on drag and cope surfaces at a nominal depth of 1/16 in. and feed of 0.0102 ipr. Tool-wear measurements were taken after each cut except at the slowest speed. To overcome the difficulty in giving a value of the uneven wearland on the tool flank, all measurements were made at a distance of 0.005 in. from the chamfer. If no apparent chipping of the tool edge occurred, tool failure was considered to occur when the wearland reached 0.025 in. To obtain a more dependable tool-wear curve, two repeat tests were made when cutting at 512 sfpm; one check test was considered sufficient for the lower cutting speeds.

The rings with 1/16 in. machined off the cast surface, were used in a second series of tests to give a comparison of tool wear for the iron

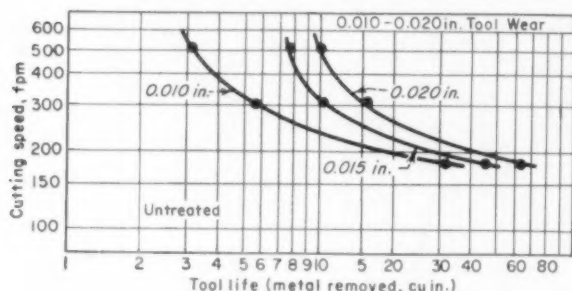


FIG. 2—Composition of untreated, high-phosphorus iron: 3.40 to 3.49 pct TC, 1.80 to 1.90 pct Si, 4.12 to 4.20 pct CE (carbon equivalent), 0.50 to 0.54 pct P. Hardness range of these irons: 217 to 248 Bhn.

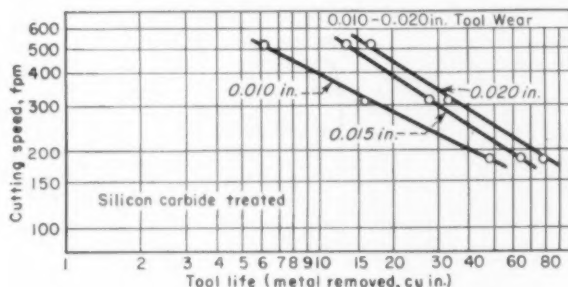


FIG. 3—Composition of silicon carbide-treated, high-phosphorus iron: 3.43 to 3.50 pct TC, 1.81 to 1.90 pct Si, 4.13 to 4.21 pct CE (carbon equivalent), 0.49 to 0.50 pct P. Hardness: 217 to 235 Bhn.

microstructure at a depth of 1/8 in. below the cast surface. For the alloyed irons it was not possible to obtain accurate tool-wear data at 512 fpm because of premature tool failures due to chipping.

Data obtained to 0.025-in. tool-flank wear were plotted directly as tool-flank wear against the number of rings cut for each of the three speeds. Original and recheck values were used to plot an average trend-line for each machining speed. From these graphs, the amounts of metal removed corresponding to tool wearlands of 0.010, 0.015 and 0.020 in. were calculated for each speed and material. The values of tool life for a given amount of wear have been plotted against cutting speed for the various irons in Figs. 2 to 4.

### Steadite helped tool life

Tool-wear results for the high-phosphorus gray irons are shown in Figs. 2 and 3. The data shows that this series of high-phosphorus gray irons are quite machinable and compare very favorably with similar tests on low-phosphorus irons of comparable chemistry. It was possible to machine a considerable number of these irons at 512 sfpm before tool failure occurred. In the 185 to 512 sfpm machining speed range, the 5 pct steadite had no detrimental effect on tool life. In fact the presence of this amount of steadite probably increased tool life at speeds below 500 fpm.

This due to the fact that steadite is the lowest melting constituent present in cast iron and the high temperature at the tool edge during cutting would be sufficient to reduce the hardness of the steadite. This reduction in hardness may even be enough to allow the steadite to smear over the tool flank to some extent during cutting, thus protecting these surfaces instead of abrading them as hard carbides would do.

The range of Brinell hardness values given in Figs. 2 and 3 can be used as a rough guide to machinability. The results on machining the as-cast surface of the treated and untreated irons showed the beneficial effect of silicon carbide on microstructure. Values obtained for tests 1/16 to 1/8 in. below the surface, compared

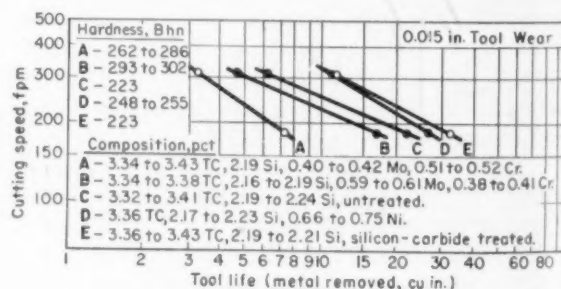


FIG. 4—Tool wear data shows unalloyed irons to have greater machinability than alloys. Silicon-carbide treated irons produced the best results for any group. In alloys the presence of nickel was beneficial.

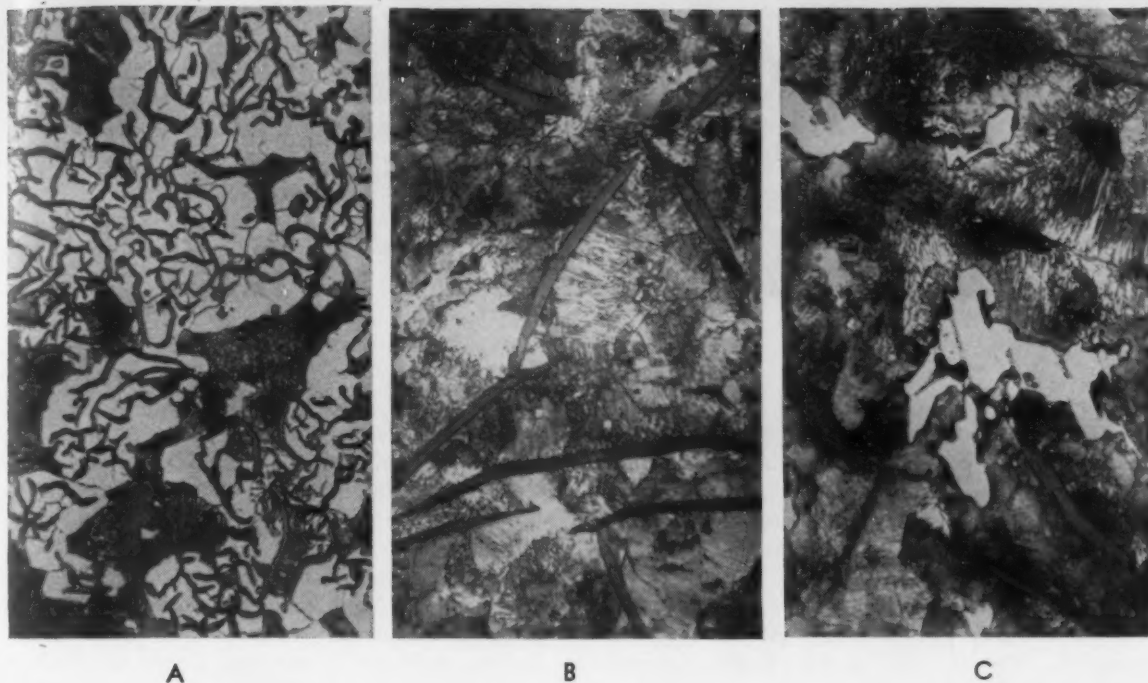


FIG. 5—Microstructures in area to be machined for (A), unalloyed iron, (B) 0.66 pct Ni alloyed iron and (C)

0.61 pct Mo, 0.41 pct Cr alloyed iron. Magnification 500X. Alloying produced little primary ferrite.

with those obtained on machining 1/16 in. off the as-cast surface, were found to be practically the same except for the low speed of 185 fpm from where it was possible to remove more metal from the premachined rings for a given tool wearland. The so-called "skin" on these cast rings increased tool wear only at the lowest machining speed.

Tool-wear results for the second series of irons are given in Fig. 4. The unalloyed irons were more machinable with the silicon-carbide treated irons producing the best results for any group. In the alloyed irons, the presence of nickel was beneficial. The chromium-molybdenum irons were the least machinable because of their carbide-stabilizing tendency. The nominal 0.60 pct Mo-0.40 pct Cr combination was more machinable than the 0.40 pct Mo-0.50 pct Cr, particularly at 210 sfpm. The Brinell hardness values in Fig. 4 provide a gauge of their relative machinability.

The microstructures for this series of rings can be correlated with the machinability test results. In the areas to be machined, large patches of primary ferrite, associated with type D graphite, were observed in all of the unalloyed irons, see Fig. 5. The amount varied more between groups and was clearly defined by the outline along the edges and at the corners on deep etching the polished cross-section of each ring composition. Alloying produced little if any primary ferrite and refined the lamellar pearlite matrix as a whole.

The strong carbide-stabilizing effect of chromium produced primary carbide grains which reduced tool life significantly, the reduction being serious above the 210 sfpm machining speed. A decreasing tool life would be expected with these changes in microstructure which fall within the progression of machinability indices for various cast-iron microstructures given in the recent Air Force machinability report.

## NEW BOOKS

*"Electric Control Systems,"* by Richard W. Jones.

For engineers and students with more than an elementary grasp of the subject, the book presents an intermediate approach to control systems. Although some fundamental concepts of feedback are considered, and operation of a few simple feedback controllers is analyzed, most of the book deals with systems, which do not involve feedback. John Wiley & Sons., Inc., 440 Fourth Ave., New York 16. \$7.75. 501 p.

*"1952 Book of ASTM Standards, Part 1."* Part

One of the ASTM standards deals with ferrous metals. The Standards comprise specifications and methods of test formally adopted by the Society. Also included are Tentatives representing the most recent industry practices and accepted by ASTM in accordance with established procedures for use pending final adoption. American Society for Testing Materials, 1916 Race St., Philadelphia 3. \$12.00. 1572 p.

# Students Build Machine to Drill Holes, Insert Dowels

♦ STUDENTS in training at the apprentice school of the International Business Machines Corp. at Poughkeepsie, N. Y., built almost in its entirety a machine to expedite precision drilling and dowelling of card stacker frames for IBM card punches and sorters.

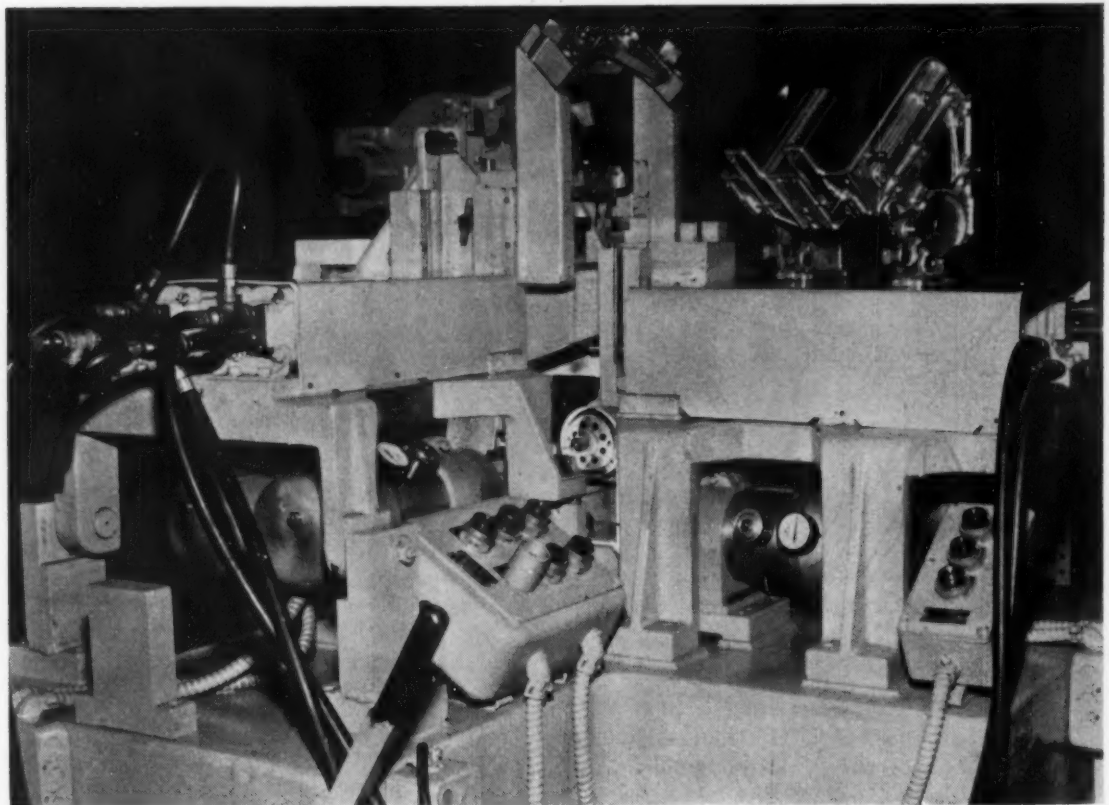
Four aluminum diecastings, machined to close tolerances, make up the frame of the completed assembly. These parts are loosely preassembled before final assembly in the machine. Clearance holes for fastening screws are sufficiently large to allow adjustment for correct positioning of all parts of the frame.

When the loosely assembled frame is placed in the machine, it is air clamped in its correct position on a locating platform or fixture. The fix-

ture is then lowered to a drilling position. Six dowel holes are drilled simultaneously by heads that advance and retract merely by pressing a button.

In the next step, the platform is elevated to an intermediate position where six dowels, fed automatically from magazines, are pressed into place simultaneously by pneumatic rams. Finally, the platform is elevated to its top position where the screws are tightened by hand and the completed stacker frame is unclamped and removed.

Operation of the machine is semiautomatic. Each operation is under the control of the operator. The machine can be reversed at any point during the cycle should trouble occur.



APPRENTICE-BUILT MACHINE aids in precision drilling and dowelling of card stacker frames for card punches

and sorters. The machine operates semiautomatically. It can also be reversed as desired.

# Use Right Draw Speeds for BETTER ELECTRICAL PROPERTIES

♦ Wire drawing speeds affect the electrical properties of 18-8 drawn stainless steel wire . . . Very high draw speeds may not permit adequate cooling between dies.

♦ This affects magnetic measurements, remanence and coercive force, tensile strength and specific resistance . . . Optimum drawing speeds may permit wider control of electrical properties in wire you use.

♦ DEFORMING ANNEALED 18-8 stainless steel at room temperature causes the non-magnetic starting structure, austenite, to transform in varying quantities into the magnetic structure, martensite. During wire-drawing the degree of change depends in part on the chemical analysis of the melt, the percent of cold reduction, and the diameter.

Carbon, manganese and nickel retard austenite-to-martensite transformation; columbium, chromium, molybdenum and silicon promote it. Each element has an effect on the degree of change. Usually there is a further conversion to martensite when the percent of cold reduction of area is increased. Large diameter wires receiving the same cold reduction of area (percent) as finer diameter wires for the same chemical analysis, exhibit less martensite than the finer wires.

A study of 18-8 stainless steel wire at the Wilbur B. Driver Co., Newark, N. J., indicated that even when the preceding factors were kept constant, considerable fluctuation existed in the magnetic properties of the wires produced. An initial study showed this inconsistency resulted from variations in draw speeds.

To determine the extent of these variations, commercial 302 and 304 stainless steels were drawn using a wide variation of speeds. Magnetic measurements, remanence (Br) and coercive force (Hc) as well as ultimate tensile strengths and specific resistances were determined. If variations of considerable magnitude were found, it was believed the data would help determine drawing rates which would yield desired properties for a particular analysis of wire.

Two specimens, types 302 and 304, Set I of Table I, were drawn at rates from 45 to 3900 fpm. By reducing 0.016-in. diam wire to 0.004-in. diam, a 93.7 pct reduction of area was obtained. To obtain this high percentage of



By Samuel Storchheim

Senior Metallurgical Engineer  
Sylvania Electric Products, Inc.  
Bayside, N. Y.

reduction, the wire at 0.016 in. was annealed at 2100°F. It was then placed in a 16CF variable speed Vaughn drawing unit, Fig. 1, and strung through 13 B&S gage dies of successively decreasing diameter, as shown in Table II.

Several hundred feet of the wire was drawn, at a particular speed. The next wire sample was drawn at a higher speed. At the higher speeds, several thousand feet of wire were run off to be sure the sample used for subsequent testing would be uniform. This was done because the desired rate of draw was not reached instantly. A short time was needed to attain required drawing speed. Rate measurements were made using a tachometer on one of the machine's pulleys.

To broaden the scope of the investigation, two additional specimens of 302 and 304 Set II, Table I, were studied for variations in properties. These were drawn from wire of larger starting diameter through nine dies in a 12 HF Vaughn wire drawing unit, Fig. 2. The B&S gage numbers and die diameters used were as shown in Table II which represents an 84.4 pct reduction of area. The 0.072-in. diam wire was softened by annealing at 2100°F. Procedure for obtaining samples was as described above. Primary difference between the two was that the speeds of draw involved were not as extensive, Set II covering a range of 625 to 1150 fpm.

Tabulation of the data obtained is shown in Tables III to VI. Curves, Figs. 3 to 6, relate the log of the rate of reduction with other properties.

For Set I, the two analyses exhibited coercive force curves which were similar with the exception that they were displaced from each other, see Fig. 3. For the 302 analysis, the curve showed that values were low at low speeds of draw, but rose quickly at moderate rates of

**Type 304 stainless shows lower coercive force values than 302 at low draw rates.**

draw to a value approximately 143 pct greater than that initially obtained. Once attained, there was little deviation from this "ultimate" value, except that caused by scatter. The 304 curve showed an initially lower Hc value than the 302 curve at low rates of draw. This value also increased as did the 302 curves, but less rapidly. The final Hc of the 304 curve increased over its initial value by approximately 143 pct.

The limited spread of draw rates for Set II did not warrant a similar plotting. However, these data plus those of Set I showed that an increase in nickel content caused an upward displacement in the relative positions of curves. The Hc was increased for the same rate of draw when the nickel content was higher.

Remanence curves for the two analyses of Set I are shown in Fig. 4. The 302 curve showed a high Br value at low drawing rates which gradually fell off at increasing rates. The curve then levelled off at high speeds of draw and remained fairly constant as in the case of the Hc values. With 304, initial values of Br at low speeds of draw were low. As the speeds of draw increased these values increased and then gradually decreased.

TABLE I

**ANALYSES OF STAINLESS STEEL**

Type	C	Mn	P	S	Si	Mo	Ni	Cr
Set I								
302.....	0.08	0.91	.....	.....	0.59	0.08	9.41	18.39
304.....	0.070	1.07	0.030	0.018	0.40	0.19	8.47	18.91
Set II								
302.....	0.12	1.50	0.025	0.019	0.70	.....	9.40	18.04
304.....	0.071	0.97	0.034	0.030	0.45	0.25	8.85	18.04

TABLE II

**DIE GAGES USED**

Set I, No. 302 and 304		Set II, No. 302 and 304	
B & S No.	Die Diam., in in.	B & S No.	Die Diam., in in.
26	0.0159	13	0.072
27	0.0142	14	0.064
28	0.0126	15	0.057
29	0.0113	16	0.051
30	0.010	17	0.045
31	0.0089	18	0.040
32	0.008	19	0.036
33	0.0071	20	0.032
34	0.0063	21	0.0285
35	0.0056		
36	0.005		
37	0.0045		
38	0.004		

The data from Sets I and II showed that samples with higher nickel contents exhibited lower values of Br at moderate-to-fast speeds of draw. However, the higher nickel 302 of Set I showed at slow draw speeds values of remanence about 45 pct greater than the lower



FIG. 1—Several hundred feet of wire were drawn through this variable speed Vaughn drawing unit. By reducing 0.016-in. diam wire to .004 in. a 93.7 pct reduction of area was obtained.

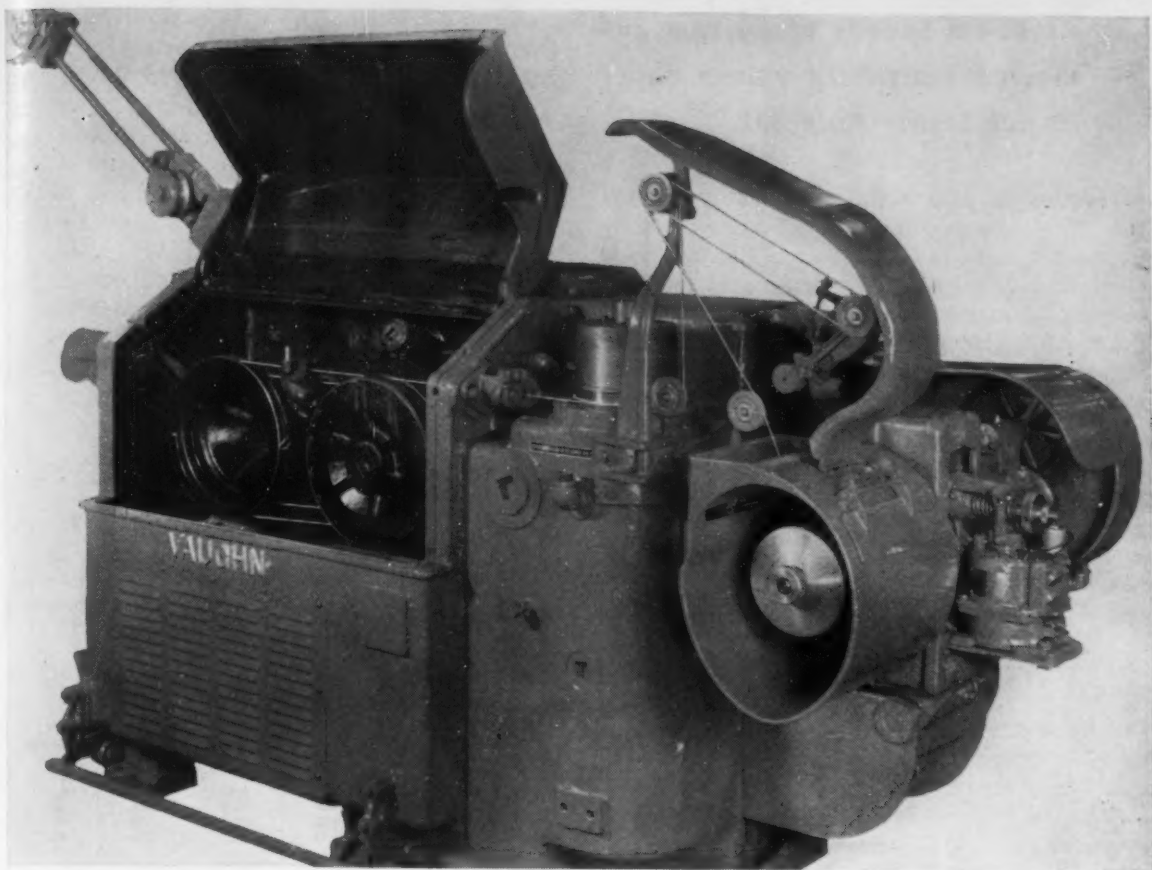


FIG. 2—Larger wire, 0.072 in. in diam, was annealed at 2100°F then run through this Vaughn drawing unit.

nickel 304. These were 9 pct higher than any value obtained with lower nickel analysis regardless of drawing rate. The variation of remanence within the higher nickel, Set I, 302 specimens, was greater over the range of draw rates than the lower nickel, Set I, 304. These variations were 51.0 pct and 27.2 pct respectively.

Plotting speed of draw v. ultimate tensile strengths of 302 and 304, Fig. 5, produced curves similar in appearance but displaced from each other. Initially, values at slow drawing speeds were high. These decreased gradually however, to a value which remained fairly constant for drawing speeds ranging from a moderate 200 fpm to a very fast speed of 3900 fpm. Maximum decrease in tensile strength obtained at fast speeds of draw for the "constant" tensile value over the initially high (slowest rate of draw) value was about 6 pct for the 302 and 4 pct for the 304.

The higher carbon 302 specimens showed tensile values about 4 pct higher for Set I and 10 pct higher for Set II. The low carbon content 304 tensile value at the rate of draw of 50 fpm was equivalent to the higher carbon containing 302 drawn at 300 fpm. The low tensile value obtained for 302 draw at 100 fpm may have been caused by imperfections along the wire length imparted by an improperly set die. Dips

in the curves at draw speed of 2000 fpm may have resulted from mechanical fluctuation of the drawing unit during operation.

Curves comparing electrical resistivity v. speed of draw generally were not too much alike. They did, however, tend to decrease as the rate increased, see Fig. 6. For the 302 curve of Set I, the sharply decreasing trend halted at a draw rate of about 300 fpm. Resistivity partially levelled off to a slowly decreasing value. Between the rates of 50 to 300 fpm a maximum drop of 10 pct was observed. The curve for 304 of Set I showed a gradual decrease through the entire range of draw rates studied. Maximum decrease in electrical resistivity was about 10 pct. In both sets of curves, highest resistivity values were found at the slowest rates of draw.

Using data from Sets I and II, it was noted that resistivities fell as nickel content increased. For the same draw speeds an analysis of higher nickel content showed a lower specific electrical resistance. At draw speeds of 50 fpm the lower nickel 304 curve of Set I showed resistivity values about 10 pct above the higher nickel 302. A maximum difference of almost 20 pct was found between the two analyses over the range of draw rates investigated.

A possible explanation of the effects on the

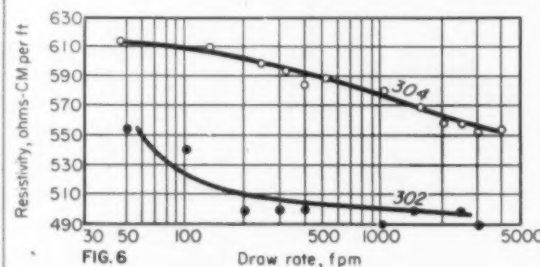
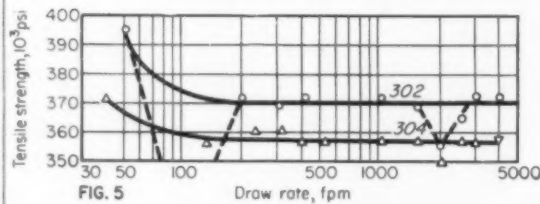
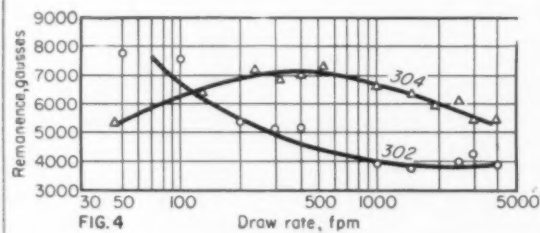
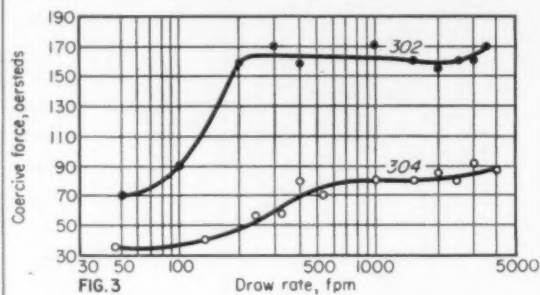
**At draw speeds of 50 fpm 304 showed resistivity values about 10 pct higher than 302.**

properties of 18-8 stainless steel of varying the draw speeds would be as follows: Cold working a metastable austenitic 18-8 stainless steel transforms the austenite to martensite, provided temperature during cold working is not much higher than room temperature. During wire drawing through one or more dies, wire temperature increases because of deforma-

tion and friction. The wire generally is cooled off by the coolant to approximately room temperature in the time required to traverse the distance between dies. Should the temperature, at higher draw speeds, rise above room temperature, less martensite will form. Consequently, remanence, resistivity, and tensile strength will be lower and the coercive force will be higher.

From the above studies, it would appear possible that an 18-8 stainless steel analysis which might normally have been considered unuseable for a particular specification, could be salvaged by the proper choice of drawing rate.

**HOW WIRE DRAW SPEEDS AFFECT ELECTRICAL PROPERTIES**



**TABLE III**

**PROPERTIES AT EACH DRAW Set I, Type 302 Stainless**

No.	Rate of Reduction, fpm	Coercive Force, Oersteds	Remanence, Gauss	Ultimate Tensile, 10 <sup>3</sup> psi	Resistivity, Ohm-cm per ft
1	50	70	7850	395	555
2	100	90	7700	325	540
3	200	160	5450	372	500
4	300	170	5180	369	500
5	400	160	5180	372	500
6	1000	170	4000	372	490
7	1500	160	3850	369	500
8	2000	155	4250	356	510
9	2500	160	4000	365	500
10	3000	160	4250	372	490
11	3900	170	4000	372	485

**TABLE IV**

**Set I, Type 304 Stainless**

No.	Rate of Reduction, fpm	Coercive Force, Oersteds	Remanence, Gauss	Ultimate Tensile, 10 <sup>3</sup> psi	Resistivity, Ohm-cm per ft
1	45	35	5330	372	615
2	130	40	6400	357	610
3	235	55	7200	361	600
4	315	55	6930	361	595
5	395	80	7070	357	585
6	610	70	7330	357	590
7	1000	80	6670	357	580
8	1500	80	6400	357	570
9	2500	85	6000	357	560
10	2500	80	6000	357	580
11	3000	90	5460	357	555
12	3900	85	5460	357	555

**TABLE V**

**Set II, Type 302 Stainless**

No.	Rate of Reduction, fpm	Coercive Force, Oersteds	Remanence, Gauss	Ultimate Tensile, 10 <sup>3</sup> psi	Resistivity, Ohm-cm per ft
1	625	220	1290	271	465
2	710	220	1270	279	460
3	815	210	1450	279	460
4	885	195	350	275	475
5	1000	240	2090	268	470
6	1120	220	2560	270	465

**TABLE VI**

**Set II, Type 304 Stainless**

No.	Rate of Reduction, fpm	Coercive Force, Oersteds	Remanence, Gauss	Ultimate Tensile, 10 <sup>3</sup> psi	Resistivity, Ohm-cm per ft
1	630	250	1440	251	455
2	740	235	1130	248	450
3	815	255	1130	241	445
4	915	240	1270	251	435
5	1050	240	1440	237	455
6	1150	235	1270	235	450

# Small Shop Owners PACK WESTERN METAL SHOW

- ◆ Owners and engineers from thousands of small shops in the West's fast-growing metalworking industry made the Western Metal Show the biggest to date.
- ◆ Ultra high-strength steels, titanium and zirconium grabbed the spotlights in technical sessions . . . Low-cost shell molding machine shown public.
- ◆ More "made in the West" machine tools shown . . . Foreign machine tool exhibits numerous . . . Wide interest in testing methods.

◆ WESTERN METALWORKING engineers and designers plus managers and shop men from thousands of small western job shops—53,553 strong—chalked up new attendance records daily at the Western Metal Congress and Exposition in Los Angeles March 23-27.

Most popular technical sessions at the downtown Statler Hotel were on titanium welding, non-destructive testing and Society of Automotive Engineers evening sessions on ultra high strength alloys—especially valuable for landing gears.

Machine tools exhibits including the largest exhibit of imports ever seen in the West plus welding, cutting, casting, cleaning and sealing exhibits at the outlying Pan-Pacific Auditorium made the show 50 pct greater than the 1951 Oakland show and twice as big as the Los Angeles show in 1949. Although Oakland actively campaigned for the 1955 show, Wm. Eisenman, American Metals Society secretary, announced at mid-week the show would again be held in Los Angeles March 21-25, 1955.

Best attended metallurgical sessions were on titanium—of intense interest to western plane-makers interested in more strength with less weight. But the wonder metal is still the subject of considerable wonderment, according to five papers presented.

F. D. Rosi and F. C. Perkins, Sylvania Electric Products, Bayside, N. J. reported the yield point phenomena noted at 200° to 300° F on titanium is similar to that of mild steel. A precipitate is suspected as causing it but has not yet been identified.

Efforts to improve machinability of titanium through additives like boron, arsenic and molybdenum disulphide have been only mildly successful. R. M. Goldhoff, H. L. Shaw, C. M. Craighead and R. I. Jaffee of Batelle Memorial Institute found no improvement such as obtained by adding lead or sulfur to steel. Minor improvements in strength were made at the expense of machinability. High purity iodide titanium machines better than commercial titanium or free-cutting steel.

Good properties can be obtained by solution treating titanium-chromium alloys in the alpha-beta temperature field, 1300°-1400°F, followed by rapid cooling, P. D. Frost, W. M. Parris, L. L. Hirsch, J. R. Daig and C. M. Schwartz, of Batelle Memorial Institute reported. They showed the alloy cannot be solution treated at beta temperatures, over 1500°F. Treatments were applied to alloys containing approximately 7 pct of alloying elements such as chromium, molybdenum or manganese. Although no final solution is in sight, the paper reported progress in knowledge of the kinetics of beta to alpha transformation.

Gas carburizing treatments in propane-argon mixtures has been found the most satisfactory surface hardening method. This method plus pack carburizing in commercial carbon materials, liquid carburizing in cyanide salt baths and induction heating were tried. With gas carburizing of commercial titanium alloys for 8 hr at 1750°F in 99.5 pct argon and 0.5 pct propane atmospheres, wear resistance was materially improved. Carburized specimens withstood wearing loads of up to 1300 psi against a hard steel plate for

# HIGHLIGHTS—

## WESTERN METAL CONGRESS EXPOSITION

**Wide interest in new methods, machines emphasizes great production strides of western metalworking industry.**

- ▶ A swing to shell molding on aircraft foundry orders, despite lag in this field by big mass producers in the foundry industry, is predicted. Shell molding is lagging 2 years, expert warns.
- ▶ Ultra high-strength alloy steels with tensile strengths in excess of 300,000 psi, described in technical sessions, evoked wide interest among aircraft engineers. It may answer need for stronger landing gear material.
- ▶ A 31,000-lb general-purpose dry-cyaniding furnace with radiant heating to 1700°F was a Westinghouse eye-opener. It's rated at 735,000 btu per hr.
- ▶ More machine tools are being made in the West. Outstanding were a new gearless turret lathe driven through variable pitch, multiple V-belt drive and magnetic clutch, a handmade low-cost vertical Galk milling machine.
- ▶ Eager hands snatched give-away titanium samples at Mallory-Sharon's first western exhibit. Titanium is edging into the western airframe market. Material delivered includes sheets, forgings and some ingots for experimental extrusion work.
- ▶ Foreign machine tools were found everywhere. Samples of Swiss, Dutch, German, Belgian and Japanese machines were shown.
- ▶ On public exhibit for the first time was the Shallco job-shop shell-molding machine developed by Stanford University graduate students. The low-cost unit turns out a 14 x 18-in. maximum pattern every 45 seconds.
- ▶ Crowd pleasers were the small rotary turner for twisting strips of ductile iron and an impact tester at International Nickel's booth.
- ▶ Zirconium's behavior and misbehavior drew plenty of attention at technical sessions. Of wide interest was the report that AEC is turning out 1000 lb of zirconium daily at less than \$10 a lb.
- ▶ Steel or cheap, expendable gray iron is still the best answer to erosion from high velocity gases, one expert contends.
- ▶ Up-to-date U. S. foundry equipment sits idle in Turkey for lack of trained personnel, a foundryman and former member of an MSA mission in Turkey told show members.

over 80 hr before seizure occurred. Untreated specimens seized immediately.

Disadvantages noted were that the case can only be about 0.002 in. or it becomes brittle, it is still ductile enough however to withstand numeral stamping. Core ductility properties are also reduced by high-temperature treatment. Possibility of producing a more ductile carburized case by co-depositing metals such as nickel or molybdenum were indicated. Induction heat treating without additional hardening such as carburizing may prove valuable in improving other properties like fatigue resistance but no substantiation of this has been developed.

A review of work on manufacture of high purity zirconium sponge at U. S. Bureau of Mines, Albany, Ore. by S. M. Shelton and E. D. Dilling was enthusiastically applauded. The zirconium samples produced by the Kroll process contained less than 100 parts per million of impurities except for oxygen content of about 1200 parts and 400 of iron. The lab has put out about \$7.5 million worth for the Atomic Energy Commission which is using it primarily in reactors and in the Westinghouse submarine unit. Production of the zirconium will be taken over eventually by a new laboratory of the Carborundum Corp. at Akron, N. Y.

Consumable electrodes which leave no impurities in arc-melted zirconium have also been developed at the lab, W. M. Stephens, H. L. Gilbert and R. A. Beall reported.

#### **Zirconium under \$10 per lb**

C. E. Lundin, D. J. McPherson and M. Hansen of Armour Research Foundation presented a new zirconium-silicon phase diagram, one of seven zirconium binary systems developed under AEC sponsorship. In a second paper the authors reported solubility of tin in beta zirconium is approximately 21 pct at the eutectic temperature, 15 pct at 1325°C and 6.5 pct at 980°C.

Oak Ridge National Laboratories are producing 1000 lb of zirconium daily for less than \$10 lb, Ed. C. Miller of the laboratory reported. Lack of proper reactor materials is a major stumbling block in atomic energy development, he reported. Principal metallurgical characteristics required are thermal stability, corrosion resistance, low neutron absorption cross-sections such as in zirconium and resistance to damage from neutron bombardment.

In the only paper presented by a steel producer, R. A. Grange and J. B. Mitchell of U. S. Steel Research Laboratory, Kearny, N. J. reported if core hardenability of boron and higher alloy steels are equal, the alloy will have a higher case hardenability. The effect of carbon and boron on hardenability of carburized steel was measured by examining the microstructure at selected carbon levels of end-quenched hardenability specimens of a matched pair of 2 pct manganese steels, one with and one without boron.

Importance of accurate control of heat treatment for best machinability and effects of various

electrolytic cleaning methods were discussed by J. W. Sands, International Nickel; C. E. Moeller, Menasco Mfg., Burbank and G. G. Wald, Lockheed. Machining methods for steels in the 260,000 to 340,000 psi range aroused considerable interest. Calculation of stresses was the major topic at a design session with papers by R. E. Greenough, Cleveland Pneumatic; M. A. Melson, Lockheed and W. E. Eldred, Consolidated Vultee.

At sessions of the American Foundrymen's Society, Frank K. Shallenberger of Stanford University said the foundry industry is at least 2 years behind on shell molding due to reticence by mass-producing auto and agricultural implement manufacturers. There are indications, he added, that in the next 6 to 8 months half of aircraft foundry orders will specify shell molding. Shallenberger also described the small job shop unit developed by his Stanford students now in commercial production at Palo Alto.

#### **Need better test equipment**

A. L. Goodreau, veteran foundryman from American Brass and Aluminum, Los Angeles, reported some alloy castings from shell molds have 10 pct greater tensile strength than green sand molds.

Hope of finding ways to eliminate wastage due to rejected finished parts brought high attendance at sessions of the Society for Non-Destructive Testing. Geo. Prudden, Lockheed Quality Control Director, highlighted the problem by saying his firm has rejected \$50,000 worth of parts, principally landing gear forgings, in the last 90 days. Where failure is a matter of life or death, doubtful parts must be rejected and development of equipment for positive knowledge of failures has lagged.

Fred Singdale of Pasadena Naval Ordnance described a 0.003-in. thick ceramic coating for stress analysis which has been used at temperatures to 800°F. H. N. Staats of Magnaflux described a new 1/32 in. thick strain gage.

#### **Ultrasonics and inspection**

Testing at high straining rates is opening the way for use of the bonded wire strain gage for both load and deformation, according to Francis G. Tatnall of Baldwin-Lima-Hamilton. He described a new universal testing machine using bonded wire strain gage load cells for plotting the Y-axis of high speed stress-strain graphs and bonded wire strain gage extensometers for plotting the X-axis under high strain within the machine.

Don Erdman of Electro Circuits, Inc., Pasadena, demonstrated audigage corrosion detection and ultrasonic (2.5 to 25 megacycles) scanning of an actual aluminum sample and Al Barath of Douglas and Peter K. Bloch of Branson Instruments, Stamford, Conn. discussed general ultrasonic inspection and portable ultrasonic resonance instruments for thickness testing and flaw detection.

# Plastics:

## MACHINERY MARKET BOOMS

### EXTRUDERS AND AUXILIARY EQUIPMENT

By H. R. Simonds

Consulting Engineer

New York

♦ Use of extrusion machines has increased in recent years . . . Lower production cost is principal reason.

♦ Average extruder weighs 8000 lb and costs \$8500 . . . Accessories add another 2000 lb to its weight.

♦ Production of 500 extruders in 1952 required 5 million lb of metal, exclusive of motors, variable-speed devices and dies . . . Users of extrusion machines needed another 5 million lb of metal for granulators, strip-coloring machines, conveyers, cutoff and slitting equipment, and roll assemblies.

#### **Fourth of a Series**

AN IMPORTANT TREND in the plastics industry in recent years has been the increasing use of extrusion machines for operations previously done by other machines or methods. Typical of this trend is the switch from calenders and casting wheels to extruders in the production of sheeting. Lower cost is only one of the reasons for this trend. An extruder can put scrap material into shape for reworking so that even a calendering plant may have use for one.

A modern extrusion machine consists essentially of a cylinder, screw, die, supporting frame,

and means for heating the cylinder and die. Other essentials are a hopper to receive material and feed it to the screw and a motor to drive the screw. These features together with precision control apparatus make up a versatile piece of equipment.

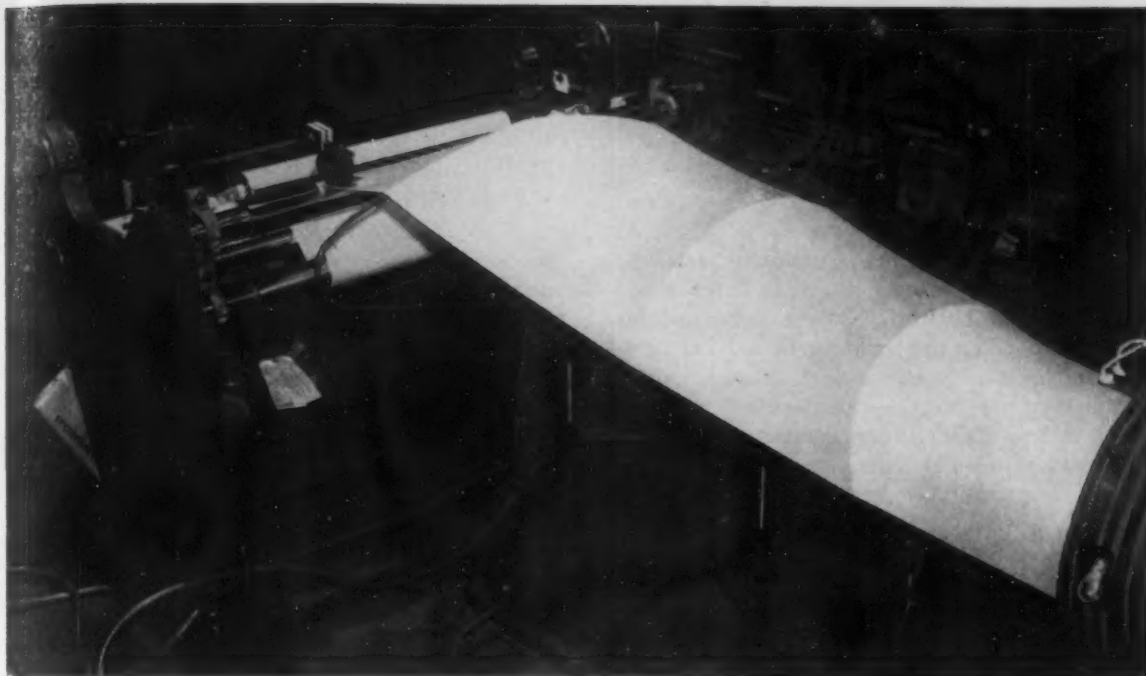
Much auxiliary equipment is often used with an extruder. More processing usually takes place after material leaves the extrusion die than in the machine itself. For example, after vinyl tubing is extruded, it is slit and formed into sheeting on auxiliary equipment. Spreader forms are of water-cooled copper tubing as are the haul-off rolls where the plastic is flattened and trimmed to 48-in sheeting. Extruders for coating wire require wire-warming devices ahead of the coating operations and elaborate take-up equipment after coating.

Other auxiliary equipment used by extruders

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HERBERT R. SIMONDS, consulting engineer specializing in plastics, is author or co-author of books on plastics, including "Handbook of Plastics." Formerly on the editorial staff of THE IRON AGE, he is now president of Hallmark Institute, Inc., New York, a consulting firm.

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PLASTIC SHEETING made by extruding tubing and slitting it. Sheeting is then spread, cooled, wound on spools.

Such an operation requires a lot of auxiliary equipment. Courtesy National Rubber Machinery Co.

includes take-off belts, water tanks for cooling monofilaments, blowers with heaters for controlled-temperature air cooling, and stretching and winding rolls.

Operations in a typical plant of a manufacturer serve to indicate what this branch of the plastics equipment industry means to metals suppliers. The Standard Machinery Co., Mystic, Conn. makes various types of extruders, but

specializes in wire-coating equipment. Its annual sales of extruders and auxiliary appliances run to \$1,500,000.

In its products raw material by weight is



RODS AND OTHER SHAPES are extruded onto take-off belts and cooled by air blast. Extrusion cylinder is in foreground. Courtesy Celanese Corp. of America.

#### EXTRUSION MACHINES IN OPERATION

1945	1946	1947	1948	1949	1950	1951	1952
850	1,200	1,400	1,600	2,000	2,400	2,800	3,300

#### METALS USED IN EXTRUDERS\*

Type of Metal	Lb per Year	Pct
Iron castings.....	2,250,000	45
Aluminum castings.....	250,000	5
Bronze castings.....	250,000	5
Steel plates.....	550,000	11
Other steel shapes.....	200,000	4
SAE 1040 bars.....	75,000	1.5
SAE 3130-3140 bars.....	75,000	1.5
SAE 4130-4140 bars.....	75,000	1.5
Type 416 stainless bars.....	75,000	1.5
Tool steel.....	225,000	4.5
Low-carbon steel.....	975,000	19.5
	5,000,000	100.0

\* Average at 1952 consumption rate.

#### STEEL IN TYPICAL EXTRUDER

Types	Pct
Plates.....	11.0
Shapes.....	4.0
SAE 1040 bars.....	1.5
SAE 3130 and 3140 bars.....	1.5
SAE 4130 and 4140 bars.....	1.5
Type 416 stainless steel bars.....	1.5
Tool steel.....	4.5
Low-carbon steel.....	19.5
Total.....	45.00*

\* Percent of total weight of metals used in the manufacture of extrusion machines at the Standard Machinery Co.

**"Screw and cylinder combination  
forms the heart of an extrusion  
machine."**

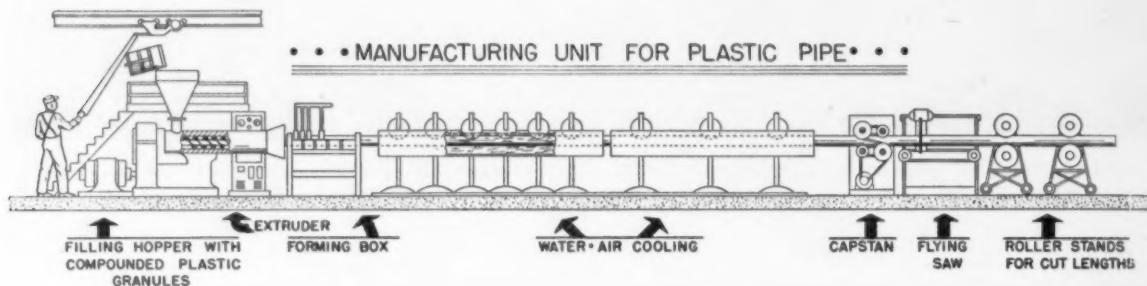
about 45 pct steel plate, bars and shapes; 45 pct iron castings; 5 pct aluminum castings; and 5 pct bronze castings. Screws are machined from SAE 4130 hot-rolled bars which are later flame hardened on the flight surfaces. The company makes nearly every part it uses, except castings, on which it does all the machining.

The screw-and-cylinder combination forms the heart of an extrusion machine. Scouring

action of the plastic material as it travels in the screw threads and against the cylinder makes it necessary to use a cylinder liner highly resistant to chemicals and abrasion. The cylinder into which the liner is pressed, is bored for heating and cooling, or machined to take heating and cooling devices on its outside surface.

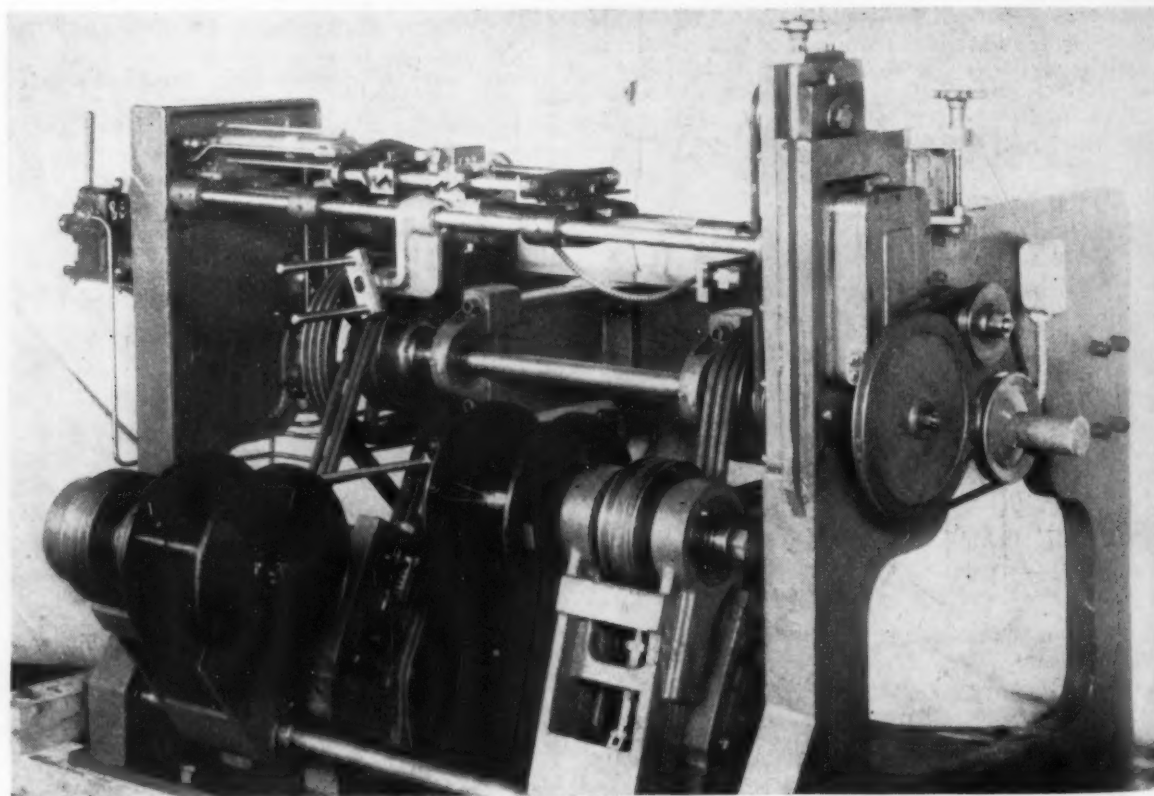
Many manufacturers of extruders use liners made of Xaloy 306 which has excellent resistance to acids and abrasion. Its composition is 38 pct Ni, 38 pct Co, 8 pct Cr, 6 pct Mo, 4 pct Si, 3 pct C and 3 pct B. Other alloys used for liners include Hastellog, Duranickel, Stellite and Nitralloy. Screws are usually stainless steel or chrome-nickel alloy.

Liners are received accurately ground on the



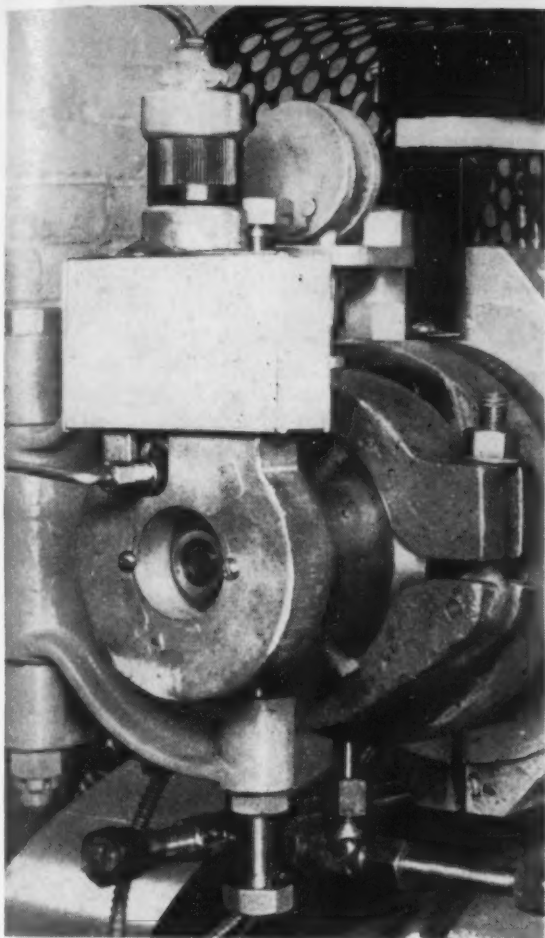
PLASTIC PIPE is probably the most promising new development in the field. This Aetna-Standard sketch shows how a manufacturing unit is arranged. Big steel pipe

makers are carefully studying plastic possibilities. National Tube Div., U. S. Steel Co., is using an Aetna-Standard extruder in pilot plant studies.

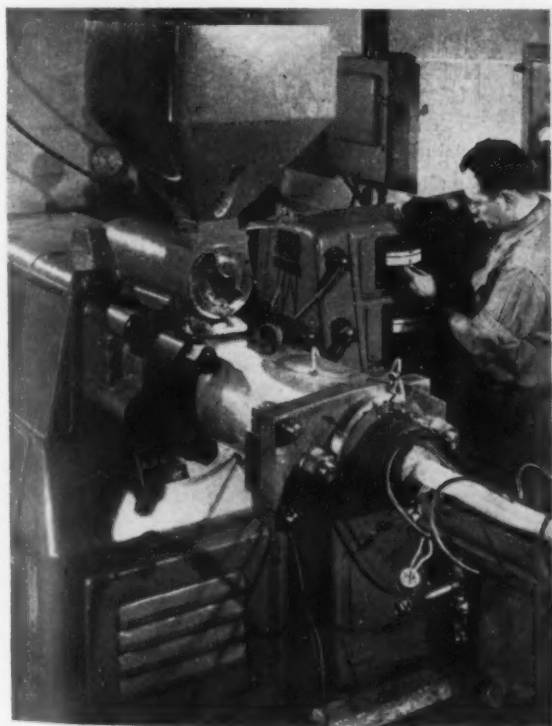


TAKE-UP UNIT for coated wire enables continuous winding of finished wire. Transfer from spool to spool is done

without stopping extrusion machine. V belts drive first one direction on one side, reverse on other side.



**EXTRUDER HEADS**, which hold dies, must be constructed for rugged use. A single nut permits opening and closing the head. Courtesy Standard Machinery Co.



**TWIN-SCREW EXTRUDERS** are being used for a greater number of applications. This one is producing rigid vinyl pipe. Courtesy F. J. Stokes Machine Co.

inside but rough on the outside. The outside is ground in the shop to a diameter larger than the inside diameter of the cylinder. The liner is then pressed into the cylinder on a press using a force of about 20 tons.

The hard alloy used for Xaloy liners is cast centrifugally on the interior of a seamless steel tube at a temperature of about 2000°F. Centrifugal casting produces a uniformity difficult to achieve by other means.

Extruder frames in this company's line are of welded plate. The take-up mechanism for coated wire has no gears or clutch. Drive and brake action are provided by triple V belts. Reels are cast aluminum and mounted at floor level to avoid damage if dropped. Most parts of the rugged head mechanism which supports the die are stainless steel.

#### **Air inside tube prevents collapse**

Dies vary greatly in size and design, from a simple opening in a mild steel block to elaborate adjustable dies made of alloy. Most dies are machined from cold-rolled steel and plated with about 0.0001 in. of chromium.

Saran and similar plastics, which corrode plain steel, require the use of Duranickel or a similar alloy. Wire coating requires an elaborate head mechanism but the dies are simple. For tube extrusion, provision is made in the die for passage of air to the inside of the tube to prevent its collapse after leaving the extruder.

Many extrusion machines are built to order for specific conditions but the 3¼-in. extruder is a popular size and is made in the Standard shops in stock lots of ten. This machine weighs 8000 lb and sells for \$8500. The control panel and instruments cost \$1500 and the electrical heating apparatus, which consists of special demountable jacket sections with Calrod heating elements and stainless steel cooling tubes integrally cast with each section, cost \$600. The machine has a production rate with vinyl materials of about 200 lb per hr.

#### **Auxiliary equipment a must**

Auxiliary equipment increases the weight of the average extruder by about 25 pct. The average extruder with accessories weighs about 10,000 lb. Using this figure for the 500 extruders sold in 1952, total consumption of metal by makers of extrusion machines would be about 5 million lb, exclusive of motors, variable-speed devices and dies.

Other equipment required by the user but not supplied by manufacturers of extrusion machines is also excluded. It includes granulators, automatic strip-coloring machines, conveyers, cutoff devices, slitting equipment and roll assemblies for drying, orienting and winding of sheeting. It is probable that machine operators use well over 10 million lb of metal annually in the form of equipment.

# Resistance Welding Gives BETTER

- ◆ More hermetically sealed electrical feed-through terminals are being used in switches, capacitors, relays, filters and meters.
- ◆ Tough job of obtaining a hermetic seal—glass-to-metal—is best done by resistance welding, experience at Fusite Corp., Cincinnati, indicates.
- ◆ Heat is localized in small areas. Welding time may be only 1/20 of a sec. Intergranular penetration and alloying of one metal with another provides a strong bond.
- ◆ Heat shock is limited to the glass-to-metal bond area. There is no flux to contaminate the sealed enclosure.



By A. J. Wyzenbeek

Chief Engineer  
The Fusite Corp.  
Cincinnati

◆ **INCREASING USE** of hermetically sealed electrical feed-through terminals has focused attention on attachment and closure problems. Welding, soldering, and brazing are all used to either fasten the terminal panels to the enclosure or attach component mounting studs or brackets to the terminal panel.

Of these methods, resistance welding is the best in most applications. Three types are used: Annular projection welding, spot-projection welding, spotwelding.

Welding is faster and less expensive than either brazing or soldering. It eliminates various methods of fastening that require additional holes through the metal envelope and resealing of these holes. It permits uniform production and can be accomplished with unskilled labor. Parts to be welded can be stock subassemblies.

Welding can take place at the most economical point in the production line. Weldments can be made through protective coatings such as tinplate. Resistance welding eliminates fluxing. Sometimes fluxing can be harmful to the electrical properties of the glass seal. Flux is also undesirable within the hermetic enclosure because it can contaminate the sealed atmosphere.

In most applications, the hermetically sealed electrodes are fused in a panel to create a multiple terminal. This panel is then attached to the unit requiring the electrical feed-through. While the panel is usually very flat, many refrigeration manufacturers use a relatively deep cup to hold the electrodes.

Heat used in joining can be an important factor. Soldering is accomplished at about 500°F; brazing starts at 1200°F; resistance welding, although requiring substantially higher temperatures, can be used because the heat is confined to a small local area. The time required may be only 1/20th of a sec. The heat is applied in a small spot and results in complete fusion of the metal. The closer the weld to the glass the more ideal the weld has to be.



SETUP used for welding mounting bracket and indexing key to plug-in hermetic terminal. Simple tooling provides quick, accurate positioning.

# GLASS-TO-METAL JOINTS

A good weld can be obtained with a minimum of heat and time. The hot forging that such a weld can provide brings intergranular penetration and alloying of one metal to another for the strongest possible bond.

Welding is used to limit the heat shock in the glass-to-steel bond area. This heat shock cannot be controlled in such an operation as brazing. With welding, the heat is dissipated from the confined weld area without materially raising the temperature of the entire panel. The bond is also stronger than the neighboring parent metal. This is particularly important in welding component mounting structures to the panel.

Brazing can be used but it should be done prior to the terminal manufacturer's fusion of the glass to the metal electrodes and panel. This involves extra operations and complicated tooling which, in turn, ride up costs.

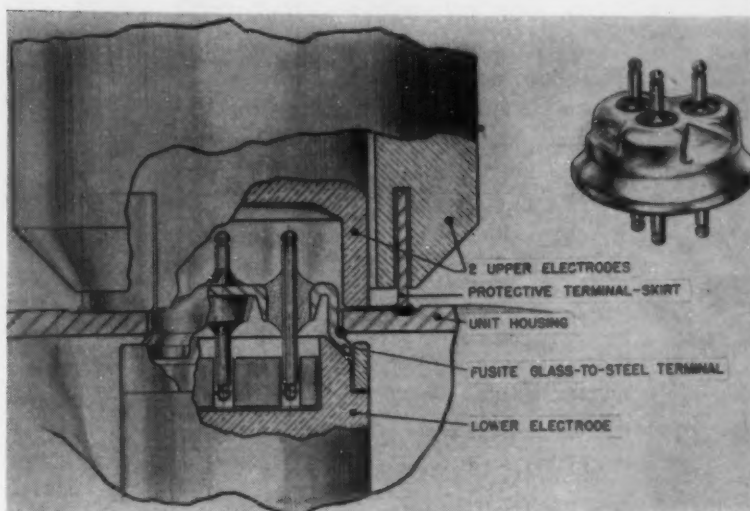
Hermetic terminals are widely used for switches, capacitors, relays, filters, and meters. Some of these require only that the terminal panel be joined to the unit; others need component mounting means joined to the panel. This latter type application is growing considerably due to emphasis on miniaturization and weight reduction. It is in this type work that welding is proving itself as an ideal method of joining.

Relay manufacturers often use welding when they wish to attach component mounting structures directly to the underside of the finished glass-to-metal terminal panel. The weld provides a solid joint without a hole through the hermetic enclosure. The parts are capable of being welded and it saves the extra operation of punching a hole.

## Control more critical in spotwelding

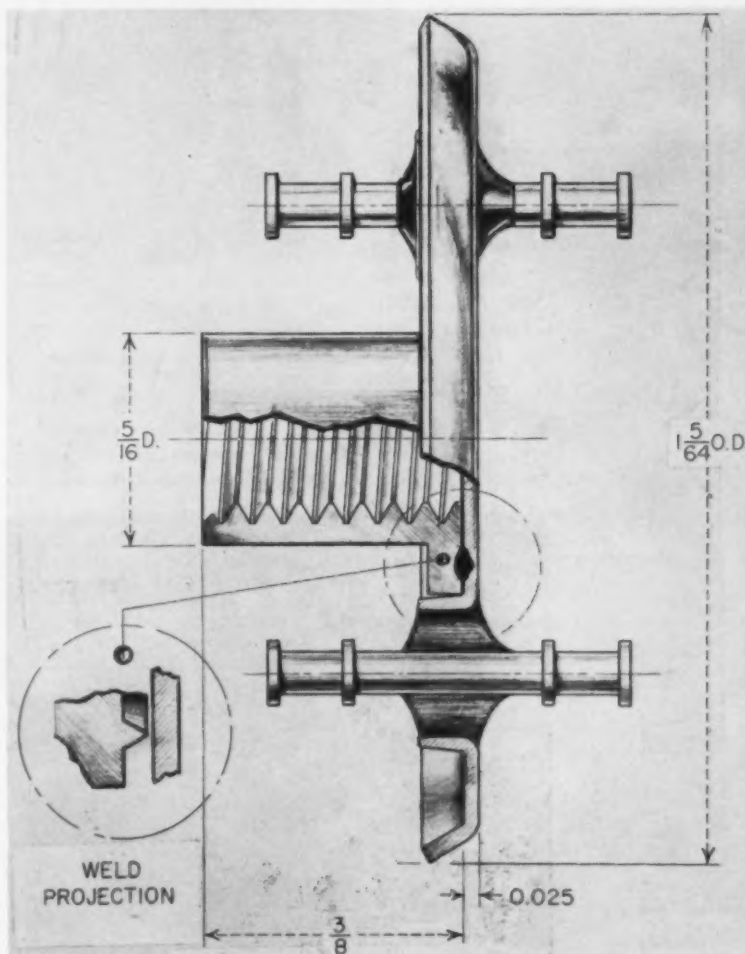
Of the three types of welding, annular or spot-projection welding is used where plated parts are to be joined. If parts must be plated prior to assembly, this need not interfere with securing of a good weld.

Contour and dimensional control is frequently more critical in spotwelding than in projection welding. The use of dimples in projection welding combined with relatively simple fixtures accurately pinpoints the weld. In projection welding, there is often wide latitude in specification of the weld regarding time, heat, and pressure. This provides a more flexible procedure. Projection welding permits use of harder and larger



TYPICAL of high production gas-tight terminal insertion method used in hermetic refrigerator compressors is this annular projection weld.

ANNULAR projection weld joins a component mounting weld nut to a hermetic terminal panel.



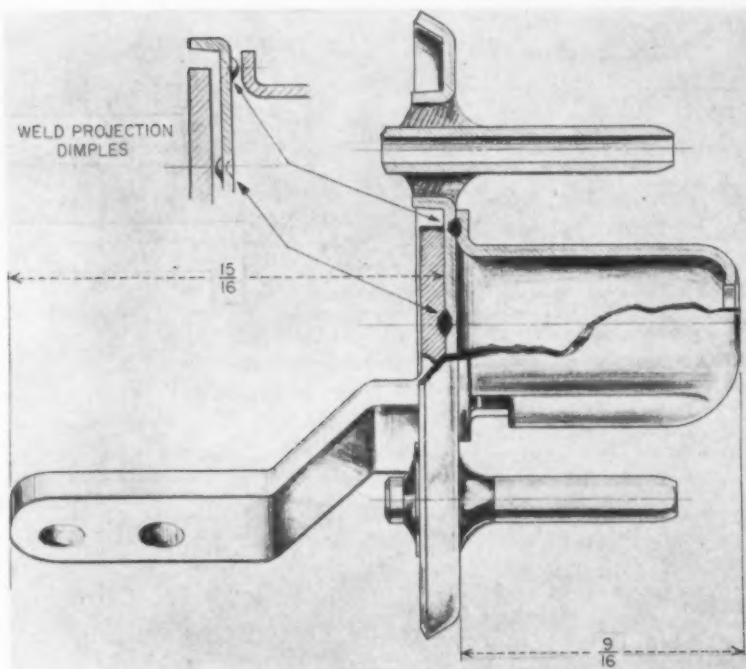
welding tips than in common spotwelding. Much longer runs are obtainable before production must be interrupted for dressing of tip faces. This means less maintenance cost, smoother production, and more production per machine hour.

The size of that section of the component mounting bracket to be welded is limited only by the area available on the terminal panel. It is not unusual to make three or four welds in an area the size of a dime. The number of welds is, of course, determined by the part to be welded and the strength required. If more than one projection is used, all projection welds are made simultaneously.

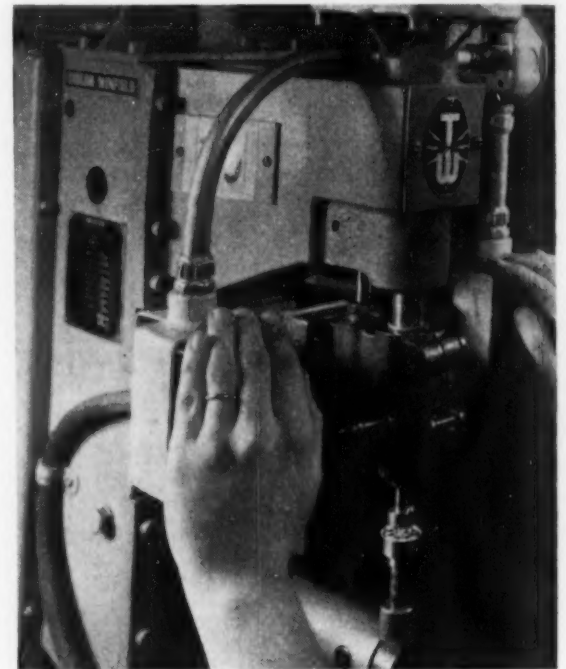
Fixtures and jigs used in welding require little initial cost and maintenance. Extreme tolerances can be made in the fixtures. In one appli-

cation, a ground pin and two guide pins were welded to a plug body in combination with three glass sealed prongs. This provided the gas tight joint which was necessary. All positioning was held to within 0.002 in.

Welding of lead wires or lugs to the electrodes of the hermetic terminal is often used. Resistance welding gives a mechanical joint that is not affected by subsequent soldering operations. It is also less affected by extremes of temperatures. This type weld is needed in extremely rigorous applications. While spotwelding is used, projection welding is also applicable. Cross wire welding, similar to that employed in the internal structure of electron tubes and incandescent lights, could also be used. However, special sensitive welding equipment is needed.



**SPOT PROJECTION** welds join component mounting bracket and indexing key to plug-in hermetic terminal. One result of this type weld is the weight reduction.



**DIRECT AIR-OPERATED** press type welder is used for many vertical lightweight welds. This Taylor-Winfield 10 kva unit has foot switch as well as palm buttons.

**GAS TIGHT ASSEMBLY WELD** of a hermetic terminal into a refrigerator housing is made on this 250 kva Resistance Welder unit. Forward slope control eliminates

metal expulsion, minimizes head inertia effect. Reverse slope control reduces thermal shock, eliminates weld hardening. Resistance welding gives strong mechanical joint.



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April 9, 1953



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## Technical Briefs

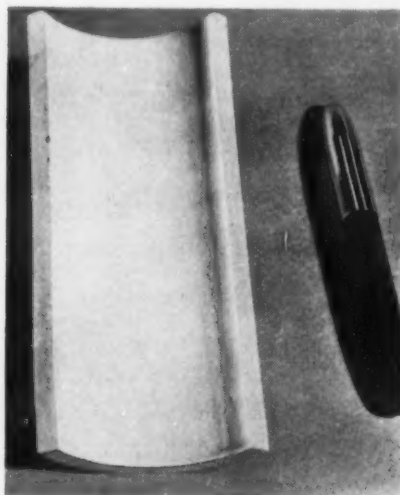
Engineering

### METAL CLEANING:

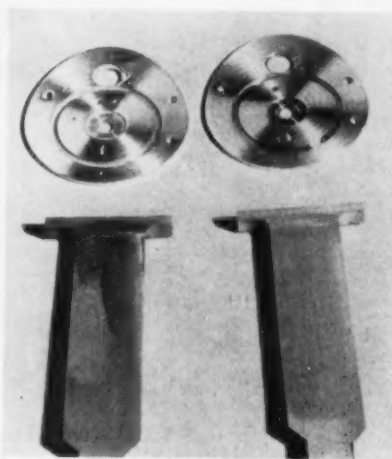
High-frequency vibrations simplify cleaning of small metal parts.

Ultrasonics is coming into its own as an aid in metal cleaning operations in the plant. Development of a new transducer element may open the door to far wider use in industry of this unusual production cleaning method.

The new transducer element developed by Detrex Corp. of Detroit, is used in place of quartz crystals previously used in ultrasonic experiments. The new unit is reported to overcome limita-



HEART of the ultrasonic cleaning process is this man-made ceramic transducer. Size, focal properties and flexibility are said to be superior to natural quartz crystals. Ceramic elements can be connected in multiple units.



BEFORE AND AFTER degreasing by ultrasonic waves. Parts at top are brass end plates for fishing reels. Parts at bottom are jet engine blades.

### IF YOU WANT MORE DATA

*You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.*

tions caused by the size and properties of quartz.

The element, jointly engineered by Detrex and the Brush Electronic Co., is a curved piece of ceramic resembling a 6-in.-long pipe, cut in half along the longitudinal axis.

#### Improved Focusing

The ceramic pieces, which can be connected in series and arranged as desired, are designed to offer focusing and flexibility properties never before found in equipment of this type, Mr. Newbery said.

Electrical energy is transmitted to the ceramic transducer, converted into sound energy, and projected through a solvent at a frequency of 430,000 cycles per second.

#### Operate In Solvent

Solvent currently being used by Detrex is trichlorethylene; however, the process is not limited entirely to this material.

Because a potential of only 40 v



CERAMIC TRANSDUCER, just below surface of cleaning solvent, provides extreme agitation.

is required to operate the ceramic transducers, they can be safely immersed directly in the solvent. This eliminates complicated sealed containers required with other transducer materials and high voltages.

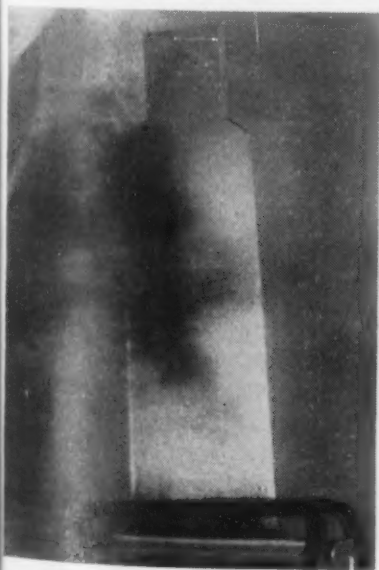
Material to be cleaned is placed in the solvent, either manually or by conveyor, directly in the path of greatest focal intensity of the ultrasonic waves. In this area an extreme turbulence is created, resulting in a deep and penetrating cleaning action that removes, almost instantaneously, all dirt, grease, chips and microscopic particles of soil from even the most intricately designed and close-fitting parts.

#### Waves Converge

Because of the design of the ceramic transducer, the sound waves converge to a straight line as long as the transducer itself.

Previously, ultrasonic cleaning was limited almost to a one-at-a-time rate, which is impractical for the demands of modern industry.

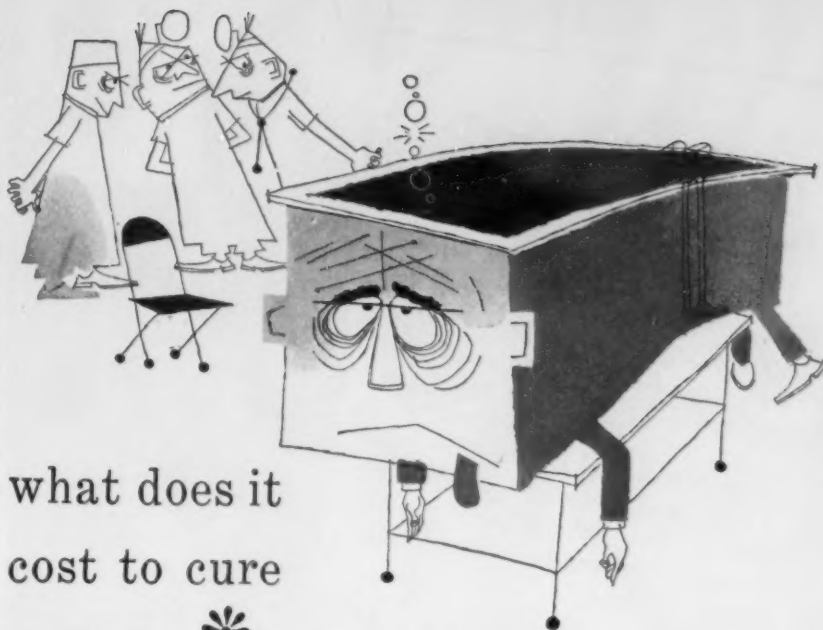
Where exceptional cleaning quality is required or where parts have fine openings, crevices and other hard-to-clean forms, the process is fast and economical.



FOREIGN MATTER adhering to surface of jet engine blade bursts away under influence of ultrasonic waves.

Turn Page

April 9, 1953



what does it  
cost to cure  
**coil-itis** in your processing tank?

The constant care it takes to keep tanks operating when they're plagued with coil-itis is extremely costly.

Downtime, and all the other maintenance time, slow heating and cooling ills of using old-fashioned pipe coils can be cured with Platecoils.

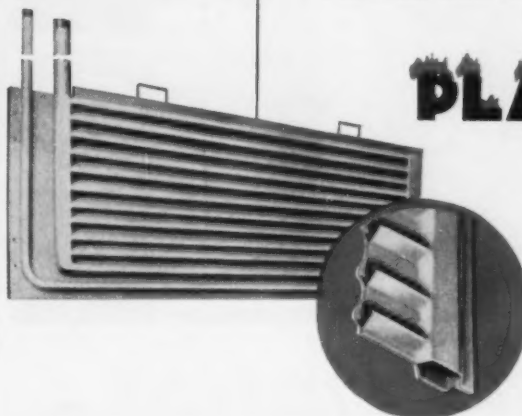
As revolutionary as the new wonder drugs, Platecoils save as much as 50% in initial cost. They take 50% less space in the tank. They simplify maintenance and save hours of downtime. Compared to the hours it takes to clean and replace pipe coils, Platecoils can be cleaned and replaced in no time at all . . . without dumping the solution.

It costs less to cure coil-itis with Platecoils than to suffer its evils. Write for bulletin P73 today!

### PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS COST  
LESS TO BUY,  
INSTALL, MAINTAIN

The Newcomb-Detroit Co., Grand Rapids Division, has found it is less costly to buy, install and maintain Platecoils than to fabricate pipe coils in their own plant. Ask about other case histories.



## PLATECOIL

REPLACES PIPE COILS



Coil-itis — Diagnosed as tank heating and cooling problems. Platecoils — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, KOLD-HOLD MANUFACTURING CO., LANSING 4, MICHIGAN

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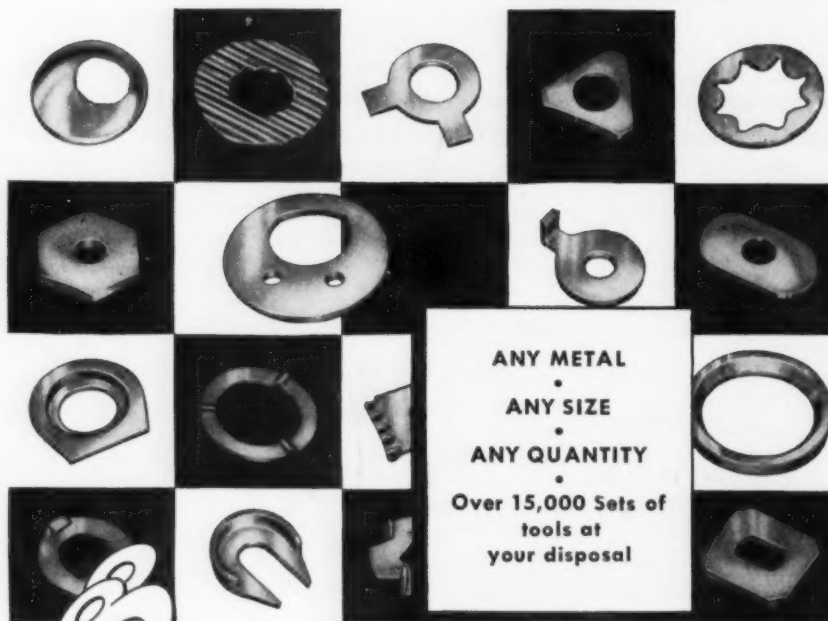
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## Technical Briefs

### INDUCTION HEATING:

Large aluminum ingot heated to  
750°F in 50 min.

Using ordinary household electric power, Aluminum Company of America has succeeded in heating a 7700-lb ingot to working temperatures nearly 15 times faster than it could be done in a conventional furnace.

The new technique of 60-cycle induction heating will be invaluable in heavy press production of big aircraft aluminum forgings and extrusions, Alcoa believes.

#### Heating Time 50 Min

Until this low-cycle method was developed, Alcoa used conventional methods such as soaking pits or other furnaces, in all its operations to bring ingots to proper forging or extrusion temperatures.

Heating a 7700-lb aluminum ingot to 750°F by conventional means, requires about 12 hr, as compared with 50 min for the low-frequency induction method.

In essence, the new method consists of placing an unheated ingot in a specially designed electrical coil. Electric energy of commercial frequency is then applied to the coil. The electric current flowing through the coil induces a heavy current in the ingot itself, and this produces the temporary rise in the metal.

#### Frequency Drop

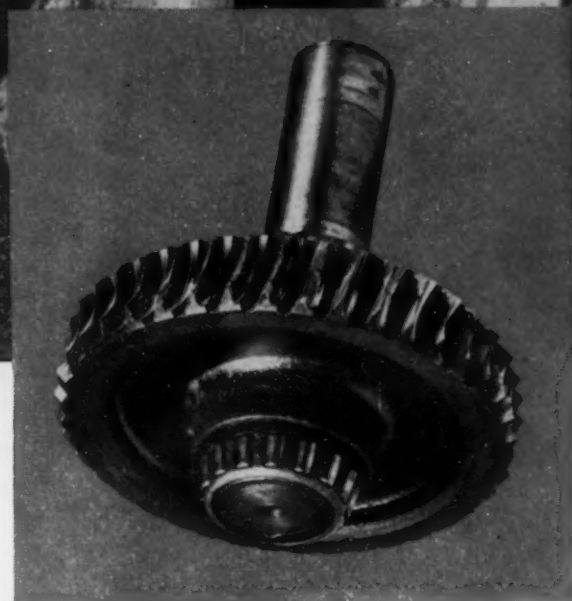
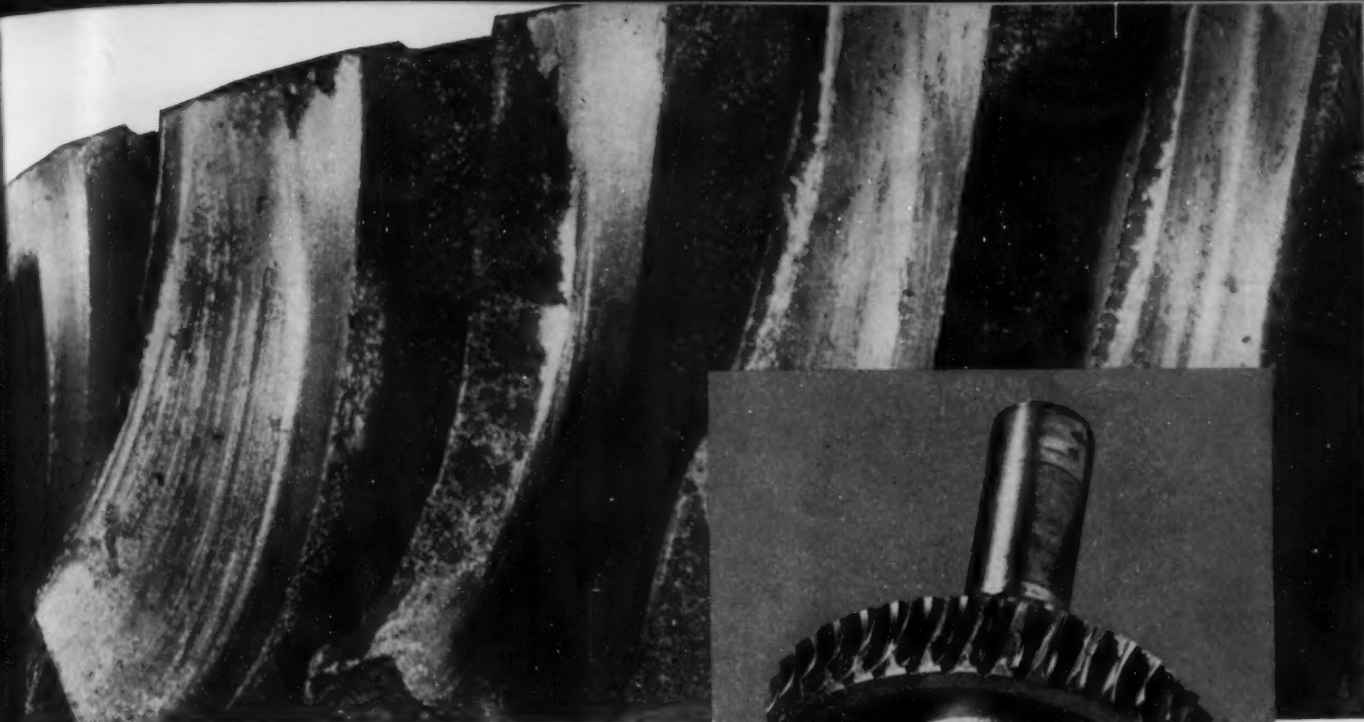
When Alcoa first started work on low-cycle induction heating, low-frequency coils were considered impractical and inefficient. Induction heating then used only current of higher than commercial frequencies, requiring expensive conversion equipment.

Alcoa's first work was with 9600 cycle coils. As experiments continued, 1000 cycle coils were used, then 360, 180, and finally 60 cycles, the same frequency as household current.

With each successive drop in frequency, Alcoa was able to improve rather than decrease efficiency. Equipment and operating costs compare favorably with conventional heating systems.

Turn to Page 154

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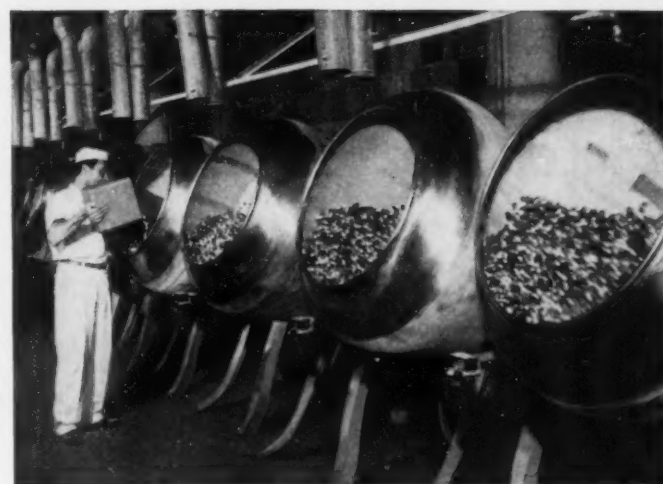
Unretouched photographs of worm gear ruined by former lubricant. The teeth are badly worn and the metal has crystallized and fractured. The sugar and starch-laden atmosphere, high temperature, extreme overload, and slow speed demand a lot of a lubricant.

# SUNEP ELIMINATES FAILURE OF SLOW-SPEED WORM GEARS

To help satisfy America's sweet tooth, Leaf Brands, Inc. resorted to a 70% overload on its revolving candy pans. This weight, plus slow speed, sugar and starch-laden atmosphere, and surrounding high temperatures, resulted in an average of 450 worm gear unit failures in one year. The lubricant could not take it.


After a test of a number of extreme pressure lubricants Sunep was selected. Because of damage caused by the former product, some units broke down during the first months following the change-over. But in the last 5½ months there hasn't been a single failure. Far less Sunep has been required, and records show an overall saving of over \$20,000 in the year it has been in use.

Send for our new booklet "Sunep"—it will not obligate you. SUN OIL COMPANY, Philadelphia 3, Pa., Dept. IA-4.



These revolving candy pans operate at 30 rpm. Sunep keeps them turning in spite of 70 percent overload.

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## Technical Briefs

### WIRE ROLLING:

Novel use of carbide rolls cuts loom reed production costs.

Squeezed between rising costs and narrowing markets, the 68-year-old Knowles Loom Reed Works Inc., New Bedford, Mass., solved a production cost problem through an unusual application of carbide rolls.

Knowles Loom rolls stainless steel wire for loom reeds used in weaving cloth from natural and synthetic materials.

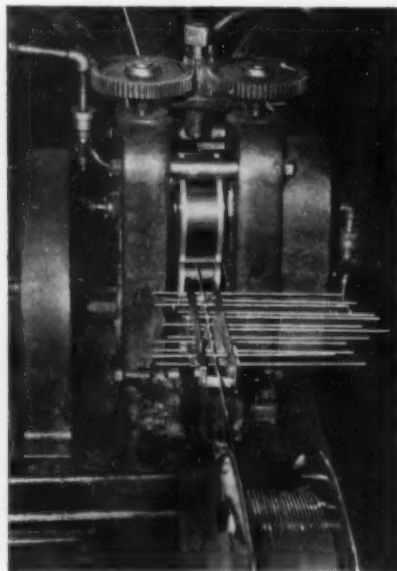
Metal rolls used in rolling wire for reeds allowed only a maximum of 2 weeks' production per spot per roll.

As they wore or mushed, the rolls tended to crown the reed wire slightly and cause rejects.

### Tolerances Are Close

Continuous checking of wire sizes was a must at the start, and during the production run, because the steel rolls expanded and contracted under the heat of the run to produce product variations.

According to Joseph Dawson, Jr., president, and a specialist in making reeds with 35 to 90 dents per inch, superior work finish, absolutely flat wire and uniformly close tolerances are necessary to facilitate producing loom reeds that pro-



TUNGSTEN CARBIDE ROLLS used in rolling stainless steel wire for loom reed equipment, have eliminated costly roll wear. Wire is passed through straighteners, foreground, after rolling.

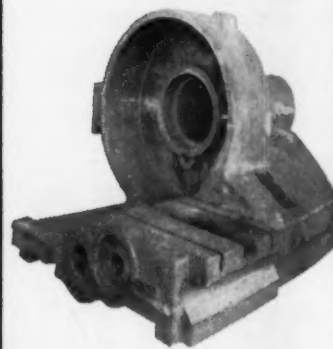
Turn to Page 162

# Hyde Park



## Gray Iron Castings

Castings of any size up to 80,000 pounds. Hyde Park facilities are equal to your every requirement



Machine Castings  
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Pinion Housings  
Mill Housings  
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# Hyde Park

FOUNDRY & MACHINE CO.  
Hyde Park, Westmoreland County, Pa.

ROLLS  
ROLLING MILL MACHINERY  
GREY IRON CASTINGS

## Technical Briefs

...the better quality woven products. The operation involves rolling the stainless wire into reeds from 0.005 to 0.025 in. thick by means of a pair of rolls running at about 70 rpm.

### Eliminate Wear

To keep the reed wire at a uniform size and to extremely close tolerances, the spot or path traveled by the material going through the rolls is changed periodically. This is done by means of adjustable guides.

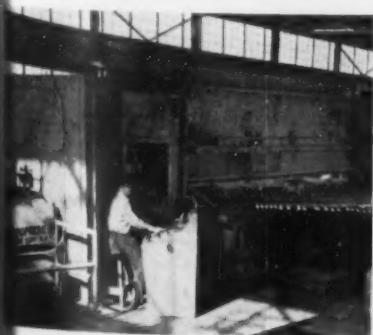
Since the spot of the wire travel becomes worn in about 2 weeks, it doesn't take long on a 9-hr, 5-day week schedule, before the whole face areas of the two rolls are worn to a point where replacements are needed.

In an effort to stretch out roll production runs and still maintain reed quality, tungsten carbide rolls made by the Carboloy Dept. of General Electric Co. were tried.

The carbide rolls eliminated the biggest headache, reed size variations. As a result, manpower requirements were also reduced. Instead of tying up one man for each machine, a lone operator could handle several, and the extra manpower would be utilized elsewhere.

### Happy Ending

After 22 months the company found that roll wear was practically nil. Instead of changing the rolling spot 24 times a year, stainless steel wire was rolled on the same spot on the carbide rolls all year with no sign of wear.



HIGH PRESSURE test bench at the Ambridge plant of Spang-Chalfant Div., National Supply Co. Unit is used for high-pressure testing of pipe and tubing. Enclosure protects workmen against flying pieces in event of pipe failure.

Turn to Page 162

# KENNAMETAL "BUTTON" TOOLS

Mounting Screw permits easy rotation of insert without changing tool setting

Sturdy Kennametal insert—indexable to several cutting positions



## UNBUTTON Production Tie-Ups

Get acquainted with this new tooling technique that handles jobs ranging from profiling to planing—gets more work done with less carbide, uses simplified tool designs, and greatly reduces grinding expense. Here are typical applications:

**PLANING:** Machine tool builder reports heavy duty button tools cut time of planing 15-foot gray iron castings from 86 to 41 minutes.

**BORING:** Car wheel maker records up to 200 wheels bored before set of four heavy duty Kennametal buttons need resharpened.

**PRODUCTION JOB:** Tractor accessory shop faces to length and chamfers both ends of more than 3600 actuating cylinders with set of three buttons.

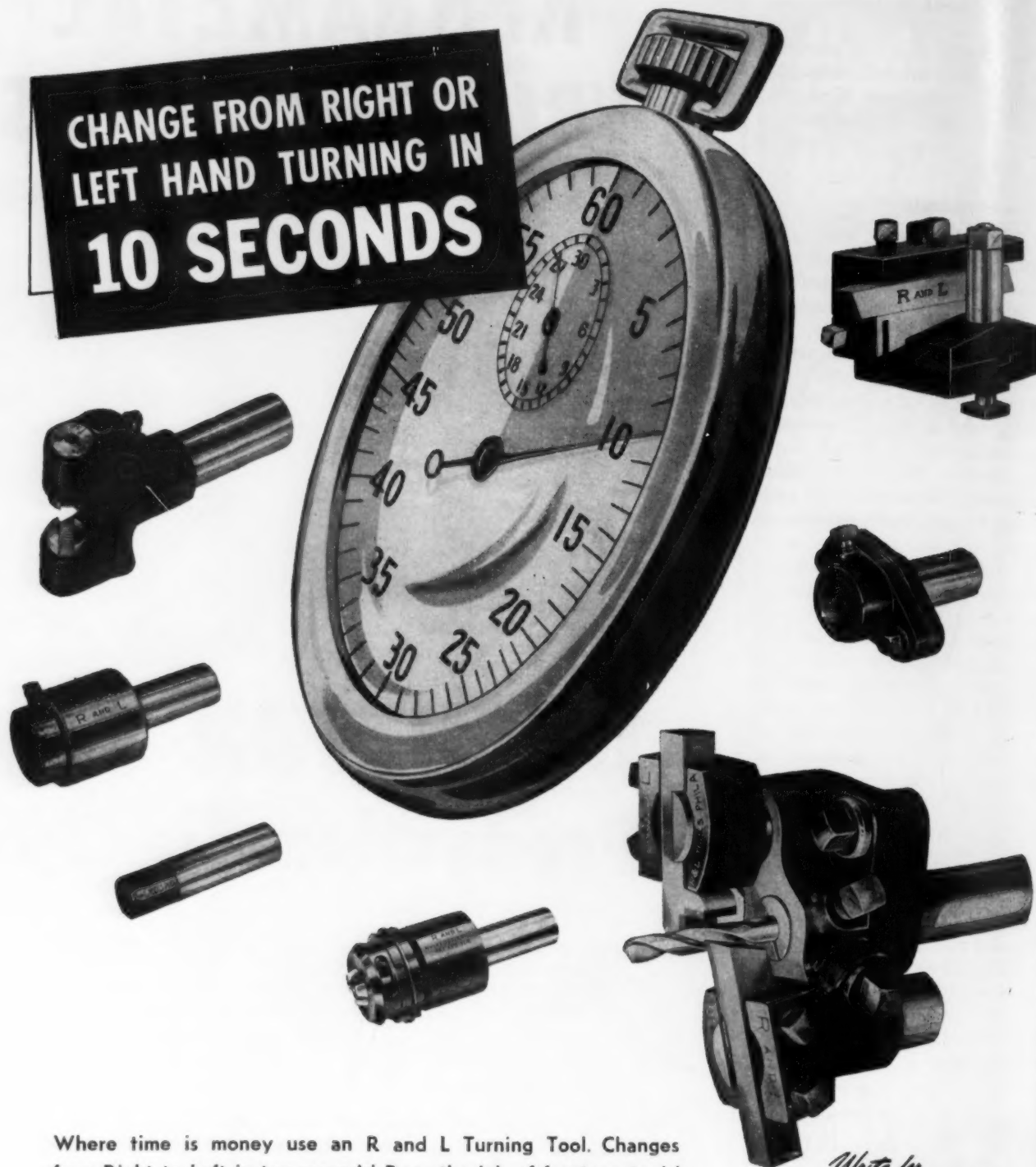
Performance reports on these and other "button-tooled" jobs will be sent—or our field engineer will give you complete information—on request. Kennametal Inc., Latrobe, Pa.

# KENNAMETAL

CEMENTED CARBIDE TOOLING  
THAT INCREASES PRODUCTIVITY



**CHANGE FROM RIGHT OR  
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10 SECONDS**



Where time is money use an R and L Turning Tool. Changes from Right to Left in ten seconds! Does the job of fourteen tools! The only tool of its kind on the market. Constructed of tough, heat-treated alloy steel guaranteed not to bend or give way.

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**ANACONDA  
WELDING RODS**

**PROUD MANUFACTURER.** Elmer Rulf points to weld made with ANACONDA-997 (Low Fuming) Rod on side piece of generator frame made of steel tubing. None of the 2,880,000 welds made on these frames has ever pulled apart.



# 2,880,000 welds

... without one customer complaint

"IN four years, we've turned out 96,000 generator frames," says Elmer Rulf, President, Eldon Mfg. & Engr. Co., Inc., Milwaukee, Wis-



**ELDON'S WELDER, JACK CORBETT,** uses ANACONDA-997 (Low Fuming) Rod to make 1 of 30 braze connections the frame needs. Eldon also brazes lawn-mower and chain saw handles, flexible tube for air ducts.

consin. "Each steel-tube frame requires 30 braze connections. On this job alone, we figure we've made 2,880,000 welds — all with ANACONDA-997 (Low Fuming) Bronze Welding Rods. We haven't heard a single complaint.

"ANACONDA-997 Bronze Rods give strong, sound welds every time. They have a low melting point, tin easily and flow freely. Work needs less preheating, too. We do the job faster and at lower cost—with no danger of warping or cracking. Our welds are cleaner, better looking and the welds are far easier to finish."

Badger Welding Distributors, who supply Eldon with all their ANACONDA Rods, hear many such

success stories. Your distributor can tell you how ANACONDA Rods can boost your own production efficiency. ANACONDA Welding Rods for many types of repair and production jobs are available from distributors throughout the United States and Canada. For latest tips on welding, write for Booklet B-13 to: *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.* 53164

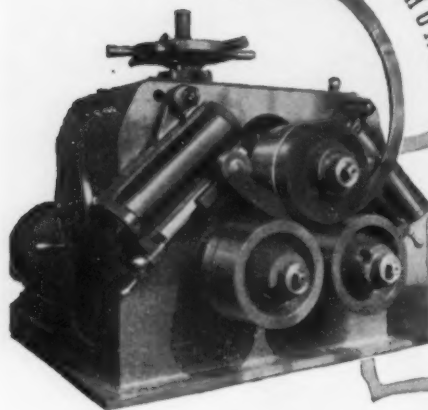
*braze or weld with confidence—*

**ANACONDA®**  
welding rods

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**CINCINNATI**

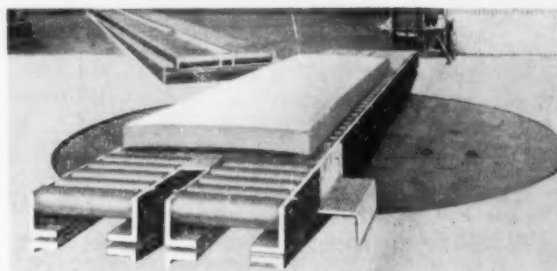
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**CONVEYING SYSTEMS** are made!



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For a discussion of latest scientific handling methods write

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565 Disney St. REPRESENTATIVES IN PRINCIPAL CITIES Cincinnati 9, Ohio

162

**Technical Briefs**

**WELD BACKUP:**

Silicone in paste form improves welds in plates, pipe.

Bouncing putty, the silicone which has intrigued children, has gone to work for industry. General Electric Co., a major silicone producer, has found it also helps improve welds in steel plates and pipe.

Silicone's unusual properties permit it to be pulled like taffy, broken with a quick snap, or bounced like a ball. Now the material is being thinned to a fluid paste and marketed as a weld-backing compound.

Painted on joints before welding, the product is said to promote uniform weld penetration and to eliminate the harmful effects of air on the underside of welds. It is suggested for use in all arc-welding processes except automatic inert-arc welding where argon is used as the shielding gas.

**Ready Materials Handling Show**

More than 3000 experts on every phase of the materials handling industry will be on hand in Philadelphia to answer visitors' questions at the 5-day National Materials Handling Exposition, May 18 to 22. An estimated \$10 million worth of machinery will be exhibited at Convention Hall.



COMMON RUBBER suction cups are used at Temco Aircraft Corp., Dallas, by punch press operated to pick up routed parts which have not been cleaned and deburred. The small suction cup is attached to a finger ring. The cups speed handling of relatively large parts and have almost completely eliminated small cuts.

Turn to Page 164

THE IRON AGE

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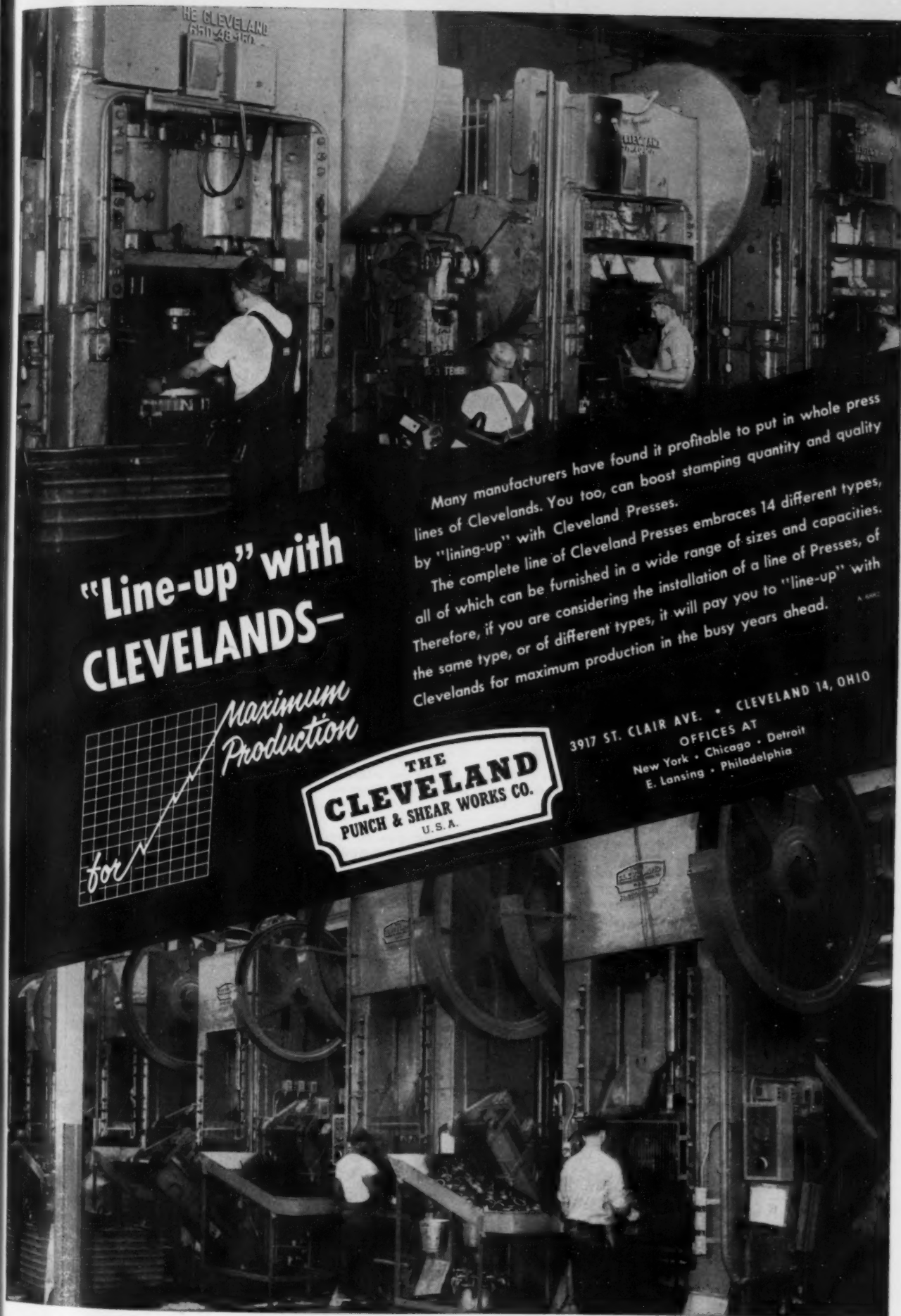
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N AGE



**"Line-up" with CLEVELANDS—**

*Maximum Production*

**THE CLEVELAND PUNCH & SHEAR WORKS CO. U.S.A.**

Many manufacturers have found it profitable to put in whole press lines of Cleveland. You too, can boost stamping quantity and quality by "lining-up" with Cleveland Presses.

The complete line of Cleveland Presses embraces 14 different types, all of which can be furnished in a wide range of sizes and capacities. Therefore, if you are considering the installation of a line of Presses, of the same type, or of different types, it will pay you to "line-up" with Cleveland for maximum production in the busy years ahead.

3917 ST. CLAIR AVE. • CLEVELAND 14, OHIO

OFFICES AT  
New York • Chicago • Detroit  
E. Lansing • Philadelphia

April 9, 1953

## PRESS FORMING:

**New press combines cushion and rubber pad process.**

A combination cushion and rubber pad process are used in a new hydraulic press developed by Hydraulic Press Mfg. Co., Mount Gilead, Ohio. Features of the Guerin and die quenching operations are incorporated in the press.

The Hidraw process was developed and perfected on a 2-year production basis by Consolidated

Vultee Aircraft Corp. of Ft. Worth, Texas. After proving its merits along with lower production costs, Convair asked HPM to build the 7000-ton production press.

To the basic Hidraw operation, HPM engineers — in cooperation with Convair and other aircraft manufacturers — added design features to incorporate the Guerin and die quenching operations.

Advantages of the process include:

(1) Superior surface finish of

part due to the fact that the part is in contact with rubber and male portion of die only while the draw operation is being performed.

(2) Uniform thickness, and minimum stretching, because the part is formed by fluid pressure and is not subjected to an ironing operation.

(3) Parts with contour difficult to form can be formed straight from the blank to the finished part since the rubber acts as a fluid pressure medium and there is no unsupported metal between the point of contact with the punch and the actual draw ring itself.

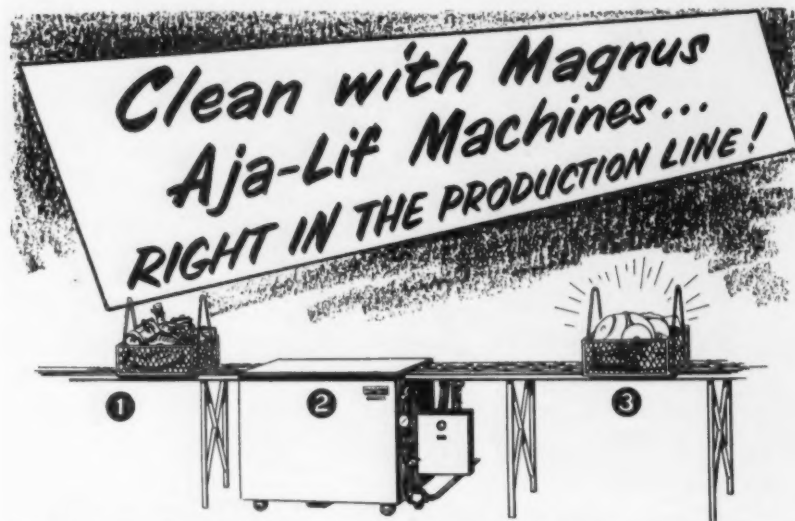
(4) Inexpensive tooling, especially where there are thousands of parts and small production lots.

(5) Elimination of expensive hand work in removing wrinkles encountered in the Guerin operation.

### How It Operates

In operation, pressure generated in the rubber pad forces a blank to assume the contour of the punch. At the same time the blank is clamped between the surface of the rubber pad and the blankholder ring which prevents wrinkles from forming. The rubber acts as a fluid pressure, insuring conformity of the drawn part to the contour of the punch.

Pressure in the hydraulic cushion which in turn controls the forming pressure developed in the



AJA-LIF IN PRODUCTION LINE. Work is loaded and unloaded at top of machine. 1.— Dirty parts from processing; 2— Cleaning in Aja-Lif; 3— Cleaned parts to finishing.



Dirty Parts Going Down!



Clean Parts Coming Up!

Magnus Aja-Lif Cleaning Machines bring you all the advantages of speed and thoroughness of the Magnus Aja-Dip principle of metal cleaning. Added to the chemical action of the cleaning solution is the vigorous and effective mechanical scouring and shearing action obtained while the work is moved up and down in the solution 90-180 times a minute.

In addition, with the Aja-Lif Machine, you load the work on the machine at waist level. When you press the starting button, the platform drops as the cover closes, and agitation starts. When ready to unload, the machine stops and the platform returns to waist level. The machine fits perfectly into the production line!

COMPRESSED AIR OPERATED... no gears, speed reducers or belts. No motors or electrical connections. Heating source to meet your needs.

WRITE FOR BULLETIN AL-701, containing the complete story on this unique metal cleaning machine.

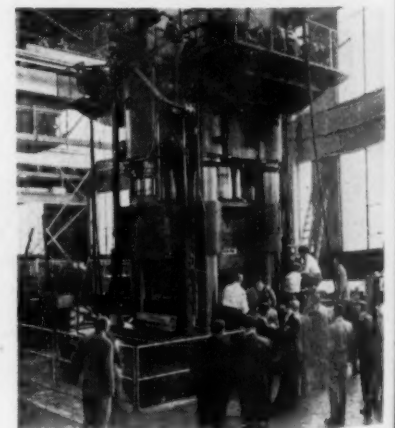


**MAGNUS CHEMICAL CO., INC.**

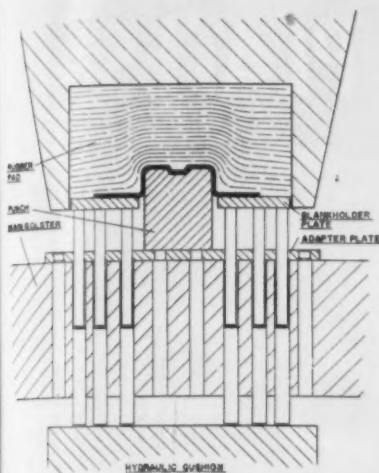
46 South Avenue, Garwood, N. J.

In Canada — Magnus Chemicals, Ltd., Montreal

Service Representatives in Principal Cities



FIRST COMMERCIAL MODEL of Hydraulic Press Mfg. Co.'s new Hidraw press recently demonstrated combines a combination cushion and rubber pad drawing process.



START OF DRAW shows part partially formed around contour of punch under pressure of rubber pad.

rubber pad is adjustable to a pre-set stroke pattern. Rubber pressures ranging from 4000 psi to as high as 10,000 psi have been employed by this process.

High tensile alloys and stainless steel parts requiring high pressure can be formed at pressures not in excess of 6000 psi.

When the draw has been completed, the platen automatically reverses. The blankholder ring remains in the down position until the pad has cleared the drawn part.

#### Automatic Slowdown

Pullback pressure is then applied to the die cushion in the bed for ejecting the drawn part from the punch. Automatic slow down at this point is incorporated in the press control circuit to prevent deforming the drawn part until it has been freed from the punch.

Loading tables are provided with sufficient carrying capacity to move the largest pad container in and out of the press with a minimum of auxiliary handling facilities and minimum of time.

#### Develop HF Gas Detection Method

A new method of identifying and continuously measuring hydrogen fluoride gas—a potentially-injurious air pollutant—has been developed at Stanford Research Institute.

The new device can detect and measure parts-per-billion of HF

gas in the atmosphere. Detection is made on a roll of filter paper impregnated with a fluorescent metal salt. Contact with the slightest trace of HF gas diminishes the fluorescence.

As the tape slowly unwinds from one spool to another, only a limited section of the moving surface

is exposed to the atmosphere. Variations in fluorescence are measured photoelectrically and the results are graphed on a continuous recorder.

The instrument is designed to record fluctuations over a period of several days and may be left unattended in the field.

THAT SETTLES IT—  
WE INSTALL  
**J&L**  
JAL-TREAD  
FLOOR PLATES



The safety of your employees and the public is good enough reason to install walking surfaces of slip-resistant J&L Jal-Tread floor plate.

But here are some other important advantages you'll get when you specify Jal-Tread, the only true checker-board floor plate.

- Reduced worker fatigue from feet rocking on uneven surfaces.
- No wheel shimmy in hand industrial trucks.
- Neat appearance . . . easy draining and sweeping in any direction.
- Easy fabrication—square design allows cutting without shearing through raised cleats . . . welding joint of uniform thickness.
- Easy cold-forming on standard equipment.

Mail the coupon for more information today. You'll find J&L Jal-Tread will pay off in greater safety . . . lower maintenance costs.

Jones & Laughlin Steel Corporation  
4031 Gateway Center  
Pittsburgh 30, Pa.

- ☐ Please send me your free booklet on J&L Jal-Tread.  
☐ Please have your representative call.

Name \_\_\_\_\_

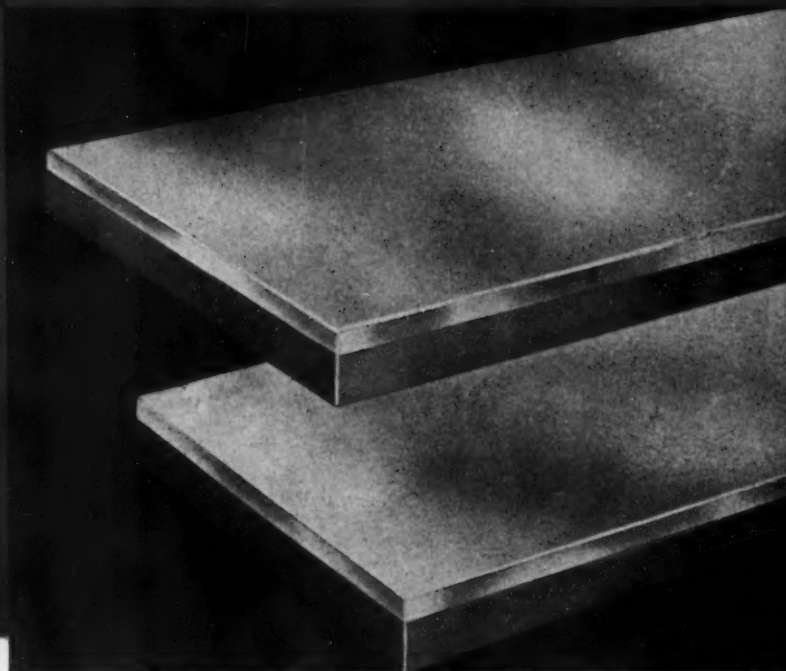
Company \_\_\_\_\_

Address \_\_\_\_\_

**J&L**  
**STEEL**



# STAINLESS-CLAD PLATES



## ***stainless steel advantages ... with carbon steel strength ... at lower cost***

If you use stainless steel in your fabrication or construction, chances are you can lower your material costs substantially by means of Claymont Stainless-Clad Plates.

In numerous and diversified applications, these plates are giving all the advantages of stainless steel, including prolonged resistance to the corrosive action of acids and alkalis.

Claymont Stainless-Clad Plates are a composite of stainless steel permanently bonded to a carbon steel backing. Easy to fabricate, they will not buckle, crack or peel under the severest forming operations. To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado

THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California

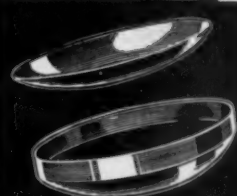
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New York • Philadelphia

CANADIAN OFFICES: Toronto • Winnipeg • Edmonton • Vancouver

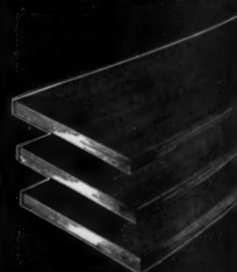
## **CLAYMONT STEEL PRODUCTS**

WICKWIRE SPENCER STEEL DIVISION

THE COLORADO FUEL AND IRON CORPORATION



Flanged and Dished Heads



Carbon and Alloy Steel Plates



Large diameter steel pipe

# Steel Strike Gamble Cost Government \$1 Billion

**Iron Age Steel Industry financial analysis shows '52 strike cost the U. S. over \$1 billion in taxes . . . Earnings off 22.3 pct . . . Sales dipped but '53 price outlook is brighter.**

The federal deficit was raised by more than \$1. billion by last summer's steel strike, according to a financial analysis of the steel industry just completed by THE IRON AGE. The 54-day strike slashed federal tax revenue 5½ times as much as it did steel industry profits.

THE IRON AGE Financial Analysis covers 27 companies representing 92.3 pct of industry capacity as of Jan. 1, 1953. The study compares operating results for 1952 and 1951.

**Earnings Dip . . .** Steel industry earnings in 1952 were \$496 million, compared to \$638 million in 1951, a decline of \$142 million or 22.3 pct. Steel's federal income taxes in 1952 were \$427 million, compared to \$1,213 million in 1951, a decline of \$786 million or 64.8 pct.

Total loss of federal revenue is well over a billion dollars when income taxes on \$360 million of lost wages by striking steelworkers, and other wage and income losses from mines, railroads and factories are considered.

(During the last week of the strike THE IRON AGE estimated total loss to the economy, exclusive of federal revenue loss, to be over \$4 billion.)

**Washington Biggest Factor . . .** It is ironic that federal tax revenue was hit harder by the strike than steel company profits because government interference in the labor dispute was the biggest factor in bringing on the strike and prolonging it.

Less than 2 weeks after the walkout began the steelworkers

could have settled for substantially the same economic terms as finally agreed upon. But encouragement from a sympathetic government, plus a willingness to "shoot the works" in an effort to win the closed shop, delayed a settlement.

**Income Off . . .** Net sales and operating revenue of the 27 producers covered in THE IRON AGE survey were slightly more than \$10 billion in 1952, compared to over \$11 billion in 1951, a drop of 9.8 pct. Net income was 4.9 pct of sales in 1952, compared with 5.8 pct in 1951, a drop of 15.5 pct.

Other comparisons of operating results showed 1952 production down 10 pct and shipments down 8.5 pct from 1951 levels. Long term debt jumped 39 pct during the year, from slightly over \$1 billion to \$1.4 billion. Surplus was up 6.4 pct and invested capital rose 8.9 pct. Working capital was off slightly.

**Dividends Bright . . .** Stockholders didn't fare too badly. Common dividends declared were off only one-half of 1 pct, an indication of industry determination to treat its owners well and thus attract more invested capital.

Outlook for 1953 is much brighter. The industry looks for peaceful settlement of wage demands from the United Steel Workers. Demand for virtually all steel products continues strong and is likely to remain so through most of the year.

**Price Hikes Will Help . . .** The industry's price picture is much brighter now that controls have

been removed. Price increases, now considered certain by about midyear, will fully compensate for higher wage costs.

Last year's unfavorable settlement, raising wage costs 25¢ an hour and prices only 4.7 pct, offset many economies which companies had been counting on to bring about a better return on the sales dollar.

**Strike Pinches . . .** This week the steel market continues to set a hot pace. Many consumers will feel a supply pinch as a result of the wildcat strike of Union R. R. which paralyzed four Pittsburgh plants of U. S. Steel Corp.

Though settled within a week, here's what it cost: Ingot loss of 125,000 tons (at a time when consumers are screaming for steel); loss of 90,000 tons of coal output from U. S. Steel mines; furlough of 40,000 steelworkers and miners at loss of \$2.5 million in wages.

**Some Stay Down . . .** Steelmaking operations this week are scheduled at 99.0 pct of rated capacity, up 2 points from last week's revised rate. Operations in the Pittsburgh area did not bounce all the way back to previous high levels because some U. S. Steel facilities are being held down for safety inspection and repair.

Production difficulties in the Pittsburgh area are reflected in anxiety in Detroit, where manufacturers were already working hand-to-mouth on some products.

**Conversion Slows . . .** Seamless, mechanical, and pressure tubing order books of one company are full through fourth quarter. Oil country conversion has slowed somewhat due to hope of consumers that they might get on the books for normal mill supplies.



## Re-check YOUR Cost Relief Zone!

**Hundreds of Other Men Responsible for Tooling and Production Have Acted on This and Profited!**

Here is a step you can take now to get relief from high production costs: *Re-check your tools and dies!* How much production time are you losing because of too frequent shutdown for die regrinding? How much *extra* money are you spending on costly die finishing, adjusting? Are your tools and dies breaking or wearing out too fast? A tool and die re-check will often give you the answers.

Take the job shown above. Knurling mills like this impress patterns on large .35% carbon steel rolls for embossing cloth and plastic. Some of the patterns are fragile and the sections as deep as 1/16" must not collapse. The mills must be hard enough to prevent upsetting, tough enough to prevent edges from breaking under pressures up to 5 tons. A re-check of the job showed that better performance could be expected if a more dependable die steel were used. Carpenter

No. 11 Special (Water-Hard) met all of these requirements . . . and provided the necessary cost relief.

If you're looking for immediate ways to bring costs down to a respectable level, act on this now. Use the Carpenter Matched Set Method to select the one steel best suited to cut costs. This Method is backed by *dependable* tool and die steels that *stay* on the job. Then, for rush delivery, call your nearest Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 121 W. BERN ST., READING, PA.

### Are You Missing These Opportunities in Your Cost Relief Zone?

- Less die finishing and adjusting
- Greater output between grinds
- Fewer heat treating failures
- Less machine downtime

**On Job After Job Carpenter Matched Tool and Die Steels Have Made Them Possible!**



# Carpenter

Matched Tool and Die Steels

Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Mill-Branch Warehouses and Distributors in Principal Cities Throughout the U. S. A. and Canada

## Market Briefs and Bulletins

**Stockpile Ores . . .** Government last week stepped up its efforts to stockpile columbium-tantalum ores by appointing Kennemetal, Inc., Latrobe, Pa., as purchasing agent. U. S. columbium-tantalum stockpile goal is 7500 tons by 1956. About 600 tons has already been obtained. The government also repeated its warning that no increase in nickel supplies is likely during the second and third quarters. Pointing up the distribution problem is the complaint by producers of high alloy steel castings that unless they get more primary nickel or alloy purchase scrap, deliveries will not meet requirements. (For story on alloying materials conservation see p. 73).

**Detroit Feels Steel Pinch . . .** In Detroit the strip steel situation is reported to be as bad as ever. Flat-rolled products are more critical than bars. There are strong rumors that several major auto producers are trying to advance their model changeover to early fall. If this happens a large portion of fourth quarter production will be on 1954 cars. This would hold off a production lag late in the year.

**Ingot Move . . .** Ingot sales are still good in the Midwest. One mill that had been laying up 10,000 tons per month for a 3-month period has sold as much as they want to and are not pushing ingot sales any more.

**Hold Price Line . . .** Mystic Iron Foundry's second quarter price for pig iron will remain unchanged at \$59.50 per gross ton at Everett, Mass., plus differentials.

**Workers Quit . . .** Four thousand machinists, boiler-makers and blacksmiths employed in 62 Seattle area plants walked off the job last week in an effort to obtain higher wages and fringe benefits. Included among those affected by the strike were: Isaacson Steel, Kenworth Motors and Pacific Car & Foundry Co. And a strike by 3400 construction workers in the San Francisco Bay area, Sacramento and Fresno has slowed normally heavy spring building activity. Strike is an attempt to enforce an American Federation of Labor Ironworkers demand for joint trusteeship of a welfare fund. More than 20 Bay area shops were shut down because of a sympathy strike by 700 AFL Bridge, Structural & Ornamental Iron Workers. In southern California more than 8200 workers were out in gas, power utility, rubber and ship towing strikes.

**Lift Restrictions . . .** Restriction on production of high speed steels has been removed through revocation of Sched. B, NPA Order M-80. At the same time the government revoked use controls on tungsten and pure molybdenum by scrapping M-81. Distribution of pure moly is still controlled under provisions of M-80. Controls on zinc exports have also been revoked.

**Have Chrome-Nickel Inventory . . .** Some warehouses in the Midwest are reported booking customer orders well ahead on 430 straight chrome stainless sheet and demand is strong. But one warehouse reports that it has actually accumulated a small inventory of tightly controlled chrome-nickel and is waiting for customers with tickets to come in and pick it up.

## STEEL OPERATIONS

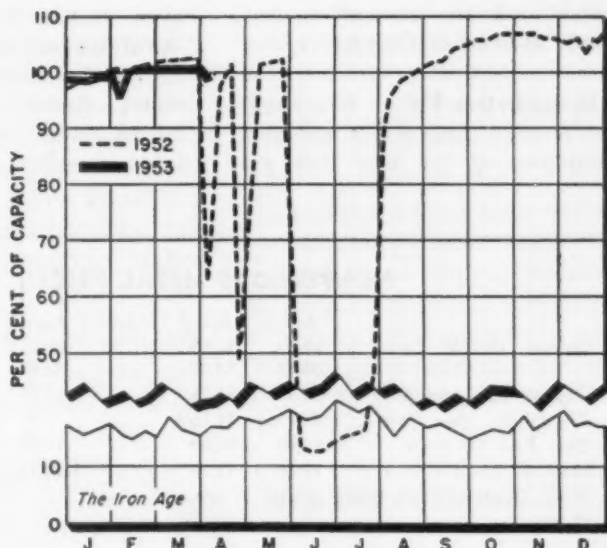


District Operating Rates

District	Week of Apr. 5	Week of Mar. 29
Pittsburgh	96.0	79.0*
Chicago	105.0	108.5*
Philadelphia	94.0	94.0
Valley	102.0	104.0*
West	110.0	104.0*
Cleveland	95.0	96.5
Buffalo	94.0	94.0
Detroit	105.0	109.0*
Birmingham (South)	101.0	99.0
Wheeling	102.0	102.0
South Ohio River	86.0	88.0
St. Louis	71.0	80.5
East	104.0	110.5
AGGREGATE	99.0	97.0*

Beginning Jan. 1, 1953, operations are based on an annual capacity of 117,522,470 net tons.

\* Revised



## Nonferrous Markets

### Main Copper Mine Producers at 30¢

**Kennecott and Anaconda reshuffle prices to Phelps-Dodge level . . . Custom smelters seen coming into line soon . . . Brass mill prices higher . . . Tin tumbles—By R. L. Hatschek.**

It happened last week. The three major domestic mine producers of copper arrived at a single price—30¢ per lb delivered Connecticut Valley. Phelps-Dodge Corp. had made its move earlier, a hike from 28.50¢ to 30¢. Then Kennecott Copper Corp. and Anaconda Copper Mining Co. revised their quotations to 30¢.

In Kennecott's case, it was an increase of 2½¢ from the previous price. And with Anaconda it was a 2¢ cut.

**Confusion Not Ended . . .** But foreign metal was still priced from 33.00¢ to 36.50¢ and custom smelters were still quoting up to 33.00¢ when we went to press. The latter may not persist very long in view of reduced scrap buying prices but it will probably take a good while for the foreign quotations to slip down to the present U. S. level.

Custom smelters have cut their scrap buying prices back to 26½¢ to 27¼¢ per lb for No. 1 copper wire, 25¢ to 25¼¢ for No. 2 and 23½¢ to 23¾¢ for light copper. These prices are in line with 30¢ copper and the custom smelters should soon be at that figure.

**Brass Prices Up . . .** Brass mills also boosted their prices last week. Samplings of the new lists are:

Hot-rolled copper sheet up 1.50¢ to 50.48¢ per lb; yellow brass sheet up 0.84¢ to 42.87¢; red brass sheet up 1.20¢ to 47.11¢; and free cutting brass rods up 0.76¢ to 36.68¢.

Scrap buying prices of the brass mills have stabilized at the level of 28½¢ per lb for heavy copper and 27⅞¢ for copper turnings. Meanwhile, dealers have cut their buying prices to 25¢ per lb for No. 1 heavy copper and wire with customary differentials on the other copper grades.

**Lake Copper Bumped . . .** After hanging up a "Sold Out" sign for April delivery of Lake copper a price hike was posted by one of the Lake producers. New price is 33.25¢ per lb, against the previous 32.125¢ price that had been established early in March.

**Tin Topples . . .** All last week tin prices throughout the free world markets were taking a shellacking. The declines were led by Singapore and the initial cause was said to be the better outlook for peace in Korea. There is also some feeling that indications of world tin output this year would be well in excess of consumer demand. Result was that buyers stayed away and prices started into a nosedive.

Tracing the pattern in the New York market, last week started at \$1.21, off ½¢ from the Reconstruction Finance Corp. resale price of \$1.21½. Next day the price was \$1.20. Wednesday saw it off another 1½¢ with 2¢ more the day after. Result at the end of the week was a tin price of \$1.16½ per lb for prompt tin in N. Y. At the end of trading on Monday, the price stood at \$1.16¼ and the direction was plainly evident.

**Introduce Tariff Bills . . .** Representative William Dawson, R., Utah, last week introduced a bill in the House which would establish a sliding scale or variable tariff on imported lead and zinc. Purpose of the bill is "to stabilize domestic production" of these metals. Trouble is that skidding prices in the past year have forced the closing of a number of marginal mines in the U. S.

A similar bill was also put before the Senate by Sen. Henry Dworshak, R., Idaho. Both bills would place a duty on lead of 1¢ per lb plus an amount equal to the amount by which an "adjusted base price" for a quarter exceeds the domestic market price.

**Terms Defined . . .** The adjusted base price is the amount that bears the same ratio to 15.50¢ that the Bureau of Labor Statistics Wholesale Price Index for the second month of the preceding quarter bears to the index of Mar. 1953. In other words, if wholesale prices generally were to remain at last month's levels, the tariff would be 1¢ plus the difference between 15.50¢ and the current New York market price. At 13.50¢ per lb, the tariff would be established at 3¢ per lb.

For zinc the import duty would be 0.6¢ per lb plus six tenths of the difference between going market prices and the adjusted base price. This would be figured the same as for lead and with zinc selling at 11.00¢, the duty would be 3.3¢ per lb.

#### NONFERROUS METAL PRICES

	Apr. 1	Apr. 2	Apr. 3	Apr. 4	Apr. 6	Apr. 7
Copper, electro, Conn. . . . .	30.00-	30.00-	....	30.00-	30.00-	30.00-
	34.50	34.50	....	34.50	33.00	33.00
Copper, Lake, delivered . . . . .	33.25	33.25	....	33.25	33.25	33.25
Tin, Straits, New York . . . . .	\$1.18½	\$1.16½	....	....	\$1.16¼	\$1.16¼*
Zinc, East St. Louis . . . . .	11.00	11.00	....	11.00	11.00	11.00
Lead, St. Louis . . . . .	13.30	13.30	....	13.30	13.30	13.30

Note: Quotations are going prices.

\*Tentative.

STEEL WOOL bursts into flame under a jet of fluorine gas in an experiment at The Whitemarsh Research Laboratory of The Pennsylvania Salt Manufacturing Company.



## When Metal Bursts into Flame

Imagine, if you can, an element so fierce it burns up steel. One that claws its way through fire-brick ... makes water burn like alcohol ... destroys almost everything it touches.

That's fluorine for you!

And for over two hundred years chemists racked their brains to find some material that would hold fluorine. Hold it for even a few minutes' study.

Numerous materials — all considered dependably resistant to corrosion — were tried. Most went up in a flash.

Some few seemed to work, momentarily. But let temperature rise a trifle, or pressure build up ... or a trace of moisture seep in ... then dig out the wreckage and start over.

Finally Nickel and its alloys were

tried. They work. They last for months where other materials failed in days or weeks.

Today, you find Nickel and Inco Nickel Alloys in equipment that produces fluorine ... in pumps and piping and valves where fluorine is compressed, stored, and processed. Nickel and Inco Nickel Alloys hold fluorine, even under heat and pressure. By the way, if you would like to know more about fluorine, ask us for a copy of "Fluorine Makes Its Debut."

### When you have a metal problem

If it's corrosion, it can't be any tougher than that caused by fluorine...

ine...and the solution may be found in Inco Nickel or one of the Inco Nickel Alloys.

Inco corrosion engineers are ready to help you. They've prepared a Corrosion Data Work Sheet to make it easy for you to outline your problem to them. Write for it, without obligation, of course.

...

Or perhaps your metal problem concerns temperatures—high or low ... stresses or fatigue resistance. Whatever it may be, Inco engineers will gladly help you find the answer. The International Nickel Company, Inc., 67 Wall St., New York 5, N. Y.

### Inco Nickel Alloys



Monel® • "R"® Monel • "K"® Monel  
"KR"® Monel • "S"® Monel • Nickel  
Low Carbon Nickel • Duranickel® • Inconel®  
Inconel "X"® • Incoloy® • Nimonic®

April 9, 1953

# Nonferrous Prices

(Effective Apr. 7, 1953)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢. 0.082-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, 1/4-in. and heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 8, 36.4¢ to 50.3¢; 12 to 14, 37.1¢ to 47.2¢; 24 to 28, 39.7¢ to 51.2¢; 36 to 38, 47.0¢ to 51.8¢.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F 38-F, 41.0¢ to 56.6¢; cold-finished, 0.875-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 55.3¢.

Screw Machine Stock: Rounds, 11S-T3, 1/2 to 1 1/2-in., 58.4¢ to 46.9¢; 3/4 to 1 1/2-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base \$600 lb.

Drawn Wire: Coiled, 0.051 to 0.374-in., 2S, 45.3¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

Extruded Tubing: Rounds, 63S-T3, OD 1/4 to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 2S x 72 in., \$1.247; x 96 in., \$1.662; x 120 in., \$2.077; x 144 in., \$2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

### Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: F31-O, 1/4 in., 66¢; 3/16 in., 68¢; 1/2 in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 1 in., 60.5¢; 1 1/4 to 1.749 in., 56¢; 2 to 5 in., 51.5¢. Other alloys higher. Base up to 1/4 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, 1/4 to 5/16 in., \$1.43; 5/16 to 1/2 in., \$1.29; 1/2 to 3/4 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, 3/4 to 1 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86 1/2	67 1/2	92 1/2
Strip, CR	92 1/2	70 1/2	98 1/2
Rod, bar	82 1/2	65 1/2	88 1/2
Angles, HR	82 1/2	65 1/2	88 1/2
Plate, HR	84 1/2	66 1/2	90 1/2
Seamless Tube	115 1/2	100 1/2	137 1/2
Shot, blocks		57	

### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51		50.53
Copper, h-r	50.48	46.83	
Copper, drawn		48.08	
Low brass	45.99	45.68	
Yellow brass	42.87	42.56	
Red brass	47.11	46.80	
Naval brass	47.01	41.07	42.33
Leaded brass			39.95
Comm. bronze	48.76	48.45	
Mang. bronze	50.73	44.62	46.18
Phos. bronze	70.50	70.75	
Muntz metal	44.91	40.47	41.72
Ni silver, 10 pct	56.56	59.83	62.89

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 20.50  
Aluminum pig 19.50  
Antimony, American, Laredo, Tex., 34.50  
Beryllium copper, per lb conta'd Be, \$37.72  
Beryllium aluminum 5% Be, Dollars  
Per lb contained Be 72.75  
Bismuth, ton lots 32.25  
Cadmium, del'd 32.00  
Cobalt, 97-99% (per lb) 32.40 to 32.47  
Copper, electro, Conn. Valley, 30.00 to 33.00  
Copper, Lake, delivered 33.25  
Gold, U. S. Treas., dollars per oz. 35.00  
Indium, 99.8%, dollars per troy oz. 32.25  
Iridium, dollars per troy oz. \$175 to \$185  
Lead, St. Louis 13.30  
Lead, New York 13.50  
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb. 27.00  
Magnesium, sticks, 100 to 500 lb. 45.00 to 47.00  
Mercury, dollars per 76-lb. flask, f.o.b. New York 2200 to 2203  
Nickel electro, f.o.b. N. Y. warehouse 63.08  
Nickel oxide sinter, at Copper Creek, Ont., contained nickel 56.25  
Palladium, dollars per troy oz. 324.00  
Platinum, dollars per troy oz. \$90 to \$93  
Silver, New York, cents per oz. 85.25  
Tin, New York 11.16 1/4  
Titanium, sponge 55.00  
Zinc, East St. Louis 11.00  
Zinc, New York 11.83  
Zirconium copper, 50 pct 56.20

## REMELTED METALS

### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot  
No. 115 29.50  
No. 120 28.75  
No. 123 28.00  
80-10-10 ingot  
No. 305 35.00  
No. 315 32.25  
88-10-2 ingot  
No. 210 44.75  
No. 215 41.75  
No. 245 36.00  
Yellow ingot  
No. 405 24.00  
Manganese bronze  
No. 421 31.00

### Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys  
0.30 copper, max. 25.25-26.50  
0.60 copper, max. 25.00-26.00  
Piston alloys (No. 122 type) 23.50-24.00  
No. 12 alum. (No. 2 grade) 23.00-24.00  
108 alloy 23.25-24.50  
195 alloy 23.50-24.00  
13 alloy (0.60 copper max.) 24.50-25.50  
ASX-679 23.50-24.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2% 24.25-26.00  
Grade 2-92-95% 23.25-24.50  
Grade 3-90-92% 22.50-23.50  
Grade 4-85-90% 21.50-23.00

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper  
Cast, oval, 15 in. or longer 45.14  
Electrodeposited 37.98  
Flat rolled 45.64  
Brass, 80-20  
Cast, oval, 15 in. or longer 43.515  
Zinc, flat cast 20.25  
Ball, anodes 18.50  
Nickel, 99 pct plus  
Cast 79.50  
Roller, depolarized 80.50  
Cadmium 32.16  
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. 94%

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63  
Copper sulfate, 99.5 crystals, bbl. 12.85  
Nickel salts, single or double, 4-100 lb bags, frt. allowed 30.00  
Nickel chloride, 375 lb drum 35.00  
Silver cyanide, 100 oz lots, per oz. 75 1/4  
Sodium cyanide, 96 pct domestic 200 lb drums 19.25  
Zinc cyanide, 100 lb drum 47.7

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	28 1/2	27 1/2
Yellow brass	21 1/2	19 1/2
Red brass	25 1/2	24 1/2
Comm. bronze	26 1/2	25 1/2
Mang. bronze	20	19 1/2
Brass rod ends	19 1/2	

### Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26 1/2-27 1/2
No. 2 copper wire	25-26 1/2
Light copper	23 1/2-23 3/4
*Refinery brass	22-23

\* Dry copper content.

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	27
No. 2 copper wire	25
Light copper	23 1/2
No. 1 composition	22-22 1/2
No. 1 comp. turnings	21 1/2-22
Roller brass (unweated)	17-17 1/2
Brass pipe	17-17 1/2
Radiators	16-16 1/2

### Aluminum

Mixed old cast	15-15 1/2
Mixed new clips	16 1/2-17
Mixed turnings, dry	14 1/2-15 1/2
Pots and pans	15-15 1/2

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	25
No. 2 heavy copper and wire	22 1/2-23
Light copper	20 1/2-21
New type shell cuttings	20 1/2-21
Auto radiators (unweated)	15
No. 1 composition	19
No. 1 composition turnings	18 1/2
Unlined red car boxes	17-18
Cocks and faucets	16-17
Mixed heavy yellow brass	13-13 1/2
Old rolled brass	14 1/2-16
Brass pipe	17-17 1/2
New soft brass clippings	18-18 1/2
Brass rod ends	17-17 1/2
No. 1 brass rod turnings	16 1/2-17

### Aluminum

Alum. pistons and struts	6 1/2-7
Aluminum crankcases	9-10
2S aluminum clippings	12-13
Old sheet and utensils	9-10
Borings and turnings	7 1/2-8
Misc. cast aluminum	9-10
Dural clips (24S)	11-11 1/2

### Zinc

New zinc clippings	6 1/2
Old zinc	5
Zinc routings	3
Old die cast scrap	4

### Nickel and Monel

Pure nickel clippings	58-60
Clean nickel turnings	58-60
Nickel anodes	58-60
Nickel rod ends	58-60
New Monel clippings	35
Clean Monel turnings	30-32
Old sheet Monel	30-32
Nickel silver clippings, mixed	15-16
Nickel silver turnings, mixed	14-14 1/2

### Lead

Soft scrap, lead	10 1/2-10 3/4
Battery plates (dry)	5 1/2-5 3/4
Batteries, acid free	4

### Magnesium

Segregated solids	15-16
Castings	14-15

### Miscellaneous

Block tin	100
No. 1 pewter	70
No. 1 auto babbitt	55-60
Mixed common babbitt	13 1/2-14
Solder joints	17 1/2
Siphon tops	60
Small foundry type	17 1/2-18
Monotype	13-13 1/2
Lino. and stereotype	13-13 1/2
Electrotype	10 1/2-10 3/4
Hand picked type shells	8 1/2-9 1/4
Lino. and stereo. dross	4
Electro dross	



## Scrap Market's Soft Almost Everywhere

**Nearly all centers report slow sales, weak tendencies . . .  
Shutdowns in Pittsburgh aggravate bearishness . . . Softness  
creeps to top steel grades . . . Other cities show softness.**

Scrap softness in almost all centers and a lagging buying pace on the part of consumers afflicted the market this week. In some centers the weakness of secondary grades began to creep upward to top steelmaking scrap. There was a "down" feeling prevalent among the trade and many saw more price cuts on the way.

Even for the premium open-hearth scrap the trend in Pittsburgh was viewed as bearish—aggravated by strike and openhearth shutdowns at U. S. Steel plants. Chicago buyers were reportedly waiting for the market to sink.

Philadelphia, New York and Boston were all waving signals of uneasiness. In New York, new orders had not materialized from one major consumer and another had no welcome mat out for scrap.

The Detroit trade pointed to the only direction the market could go—down. And Birmingham's largest scrap user withdrew from the market again. The Cleveland market was at a standstill.

**Pittsburgh**—Developments last week created a soft market in this district. Trend is decidedly bearish, even for the top melting grades. A railroad strike that closed district operations of U. S. Steel Corp. hit scrap consumption and forced a holdup of shipments that likely will continue in effect for several weeks. Meanwhile U. S. Steel's No. 3 openhearth shop with 20 furnaces is down for a safety inspection and six openhearth at Duquesne works are down for 2 to 3 weeks for building repairs. This means reduced consumption on top of already-high scrap inventories.

**Chicago**—Steelmaking grades began to show some slowing, along with the still down-skidding blast furnace items. Brokers were asking \$27 for

blast furnace grades, but weren't very optimistic about getting it. Electric furnace and forge crops still are healthy. Good factory bundles were still strong, commanding a premium in scattered sales. Purchasers of nearly all grades are waiting for what they feel is a falling market.

**Philadelphia**—Despite a quiet holiday week, new buying knocked \$1 off the price of steelmaking grades. Cast grades are also quoted lower this week, and low phos, while unchanged in price, has a softer tone. Yard intake is slipping and dealers are pessimistic, feeling there may be further cuts in the offing.

**New York**—Last week's downward tone trend of secondary steelmaking grades continued this week and was spiced up by weakness in some top material. Blast turnings were slightly weaker after last week's dip. There was no heavy buying of any grade. The market was too vulnerable to fluctuation to chance any stocking up.

**Detroit**—The scrap market remained placid with secondary grades showing still further signs of weakness. Good demand still exists for top grades, but otherwise there is only one direction the market can go—down. Brokers are speaking in terms of another \$2 drop in No. 2 heavy melting and a parallel slump in turnings before the end of the month.

**Cleveland**—The market here was at a standstill this week as bearish sentiment prevailed. Although there were no price changes, high rejection rate and slow mill buying seemed to point to further price decline. Most scrap dealers supplying Cleveland and the Valley don't expect the bottom to drop out so long as steel production remains high. Weakness in the turnings market continued as one mill held up shipments.

**Birmingham**—Steel scrap movement to the North picked up this

week but the largest buyer in the area was out of the market again. Brokers say purchases of No. 1 heavy melting have just about stopped and mills in the area are concentrating on No. 2 heavy melting and No. 2 bundles. Some price adjustments were made to bring them more in line all down the list. Dealers say reduced prices have cut down the amount of scrap being offered.

**St. Louis**—A district steel mill came into the market for a sizable tonnage of No. 2 heavy melting steel at \$2 and No. 2 bundles at \$4 reduction for shipment not before Apr. 15. The same mill is accepting shipments of old orders on a ration basis because of congestion. Another mill is accepting orders on a limited basis from identified sources of shipment at \$3 reduction for No. 2 heavy melting steel. Rails and angle bars are each off \$2.

**Cincinnati**—Mills are in a comfortable position and brokers say they have no trouble finding scrap. Price of short turnings and cast iron borings dropped \$2 to \$31. Very few price changes are expected until heavier buying starts in about 10 days. Brokers and dealers here believe a ceasefire in Korea wouldn't weaken the market appreciably.

**Buffalo**—Recent price advance in No. 1 heavy melting steel was partly erased with new business reported at \$46, a drop of \$2. No change was reported in other steelmaking grades. New business also was reported in cast scrap at prevailing prices. Cast market continues weak.

**Boston**—Secondary steelmaking grades were queasy last week, with No. 2 bundles off \$1. Other steel grades were uneasy in spite of a few sales of specially selected No. 1 heavy at higher prices. Cast prices tumbled \$3, and some trade sources felt steel grades might follow them in a decline.

**West Coast**—Lower quality scrap, especially No. 2 heavy melting continued to be a drug on the market in Los Angeles. Mills continued to favor top quality scrap inventories to get highest production. Cast prices stayed at \$39 in Los Angeles. Cast supplies are drying up as marginal auto wreckers are going out of business due to low price and demand.

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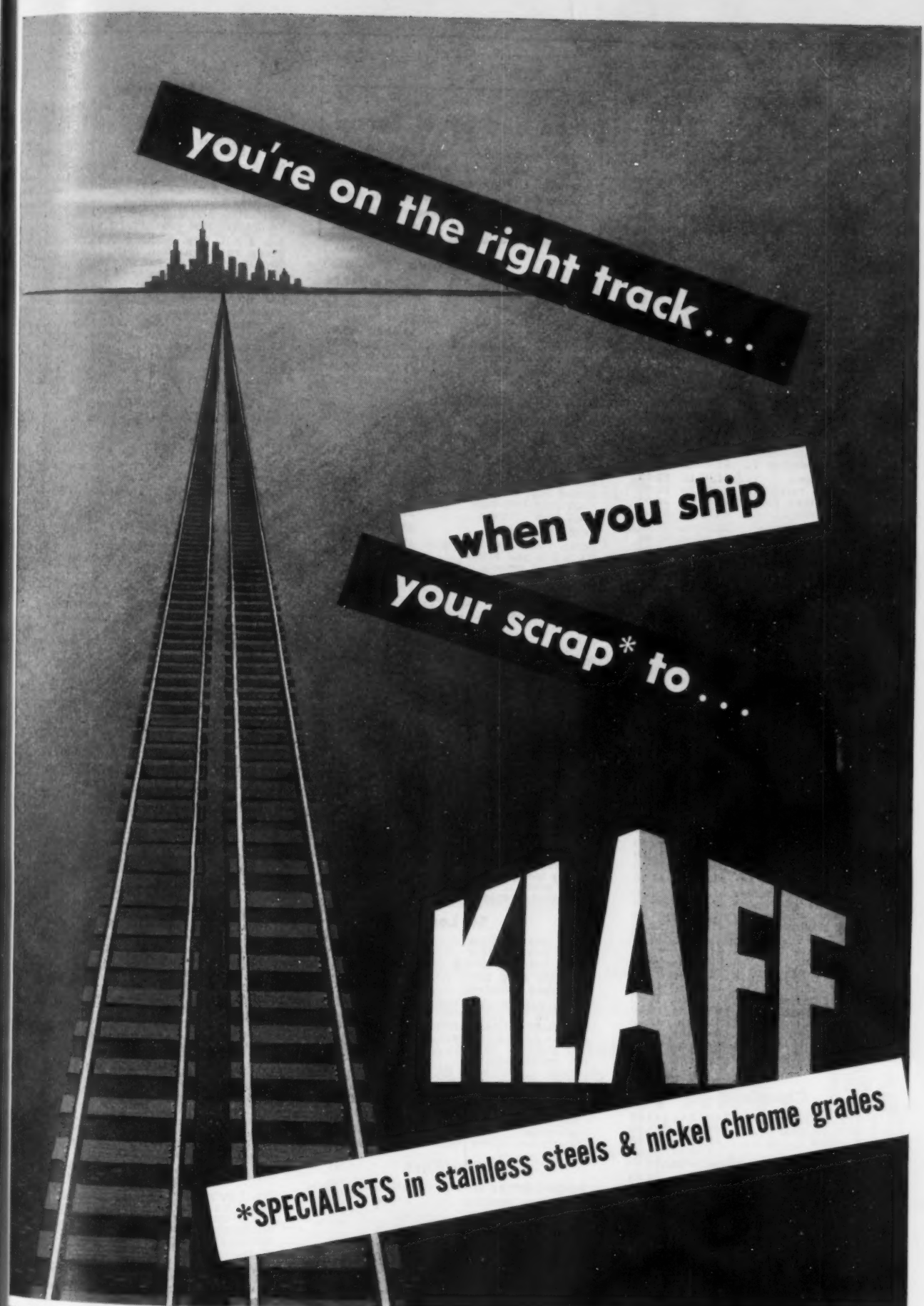
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**April 9, 1953**

# Scrap Prices

(Effective Apr. 7, 1953)

## Pittsburgh

No. 1 hvy. melting	\$44.50 to \$45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.50 to 45.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	29.00 to 29.50
Mixed bor. and ms. turns	29.00 to 29.50
Shoveling turnings	35.00 to 36.00
Cast iron borings	36.00 to 37.00
Low phos. punch'gs, plate	50.00 to 51.00
Heavy turnings	43.00 to 44.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	48.00 to 49.00
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	55.50 to 56.50
RR. spring steel	55.50 to 56.50
RR. couplers and knuckles	55.50 to 56.50
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	42.00 to 43.00
Malleable	49.00 to 50.00

## Chicago

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 factory bundles	44.00 to 46.00
No. 1 dealers' bundles	43.00 to 44.00
No. 2 dealers' bundles	38.00 to 40.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs, plate	47.00 to 49.00
Low phos. 3 ft and under	45.00 to 47.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	53.00 to 54.00
Rerolling rails	56.00 to 57.00
Rails 2 ft and under	58.00 to 59.00
Locomotive tires, cut	51.00 to 52.00
Cut bolsters & side frames	50.00 to 51.00
Angles and splice bars	54.00 to 55.00
RR. steel car axles	63.00 to 64.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoes	41.00 to 42.00
Cast iron car wheels	45.00 to 47.00
Malleable	43.00 to 44.00
Stove plate	39.00 to 40.00

## Philadelphia Area

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	29.50 to 30.50
Mixed bor. and turn.	34.50 to 35.50
Shoveling turnings	34.50 to 35.50
Clean cast chem. borings	41.50 to 42.00
Low phos. 5 ft and under	45.50 to 46.50
Low phos. 2 ft and under	47.50 to 48.50
Elec. furnace bundles	45.50 to 46.50
Drop forge trimmings	41.50 to 42.50
Heavy turnings	41.50 to 42.50
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
Rails 18 in. and under	58.00 to 59.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	47.00 to 49.00
Malleable	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	47.00 to 49.00
Charging box cast.	43.00 to 44.00

## Cleveland

No. 1 hvy. melting	\$43.50 to \$44.50
No. 2 hvy. melting	40.50 to 41.50
No. 1 bundles	43.50 to 44.50
No. 2 bundles	38.50 to 39.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. 2 ft and under	49.00 to 50.00
Drop forge flashings	42.00 to 43.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails 3 ft and under	60.00 to 61.00
Rails 18 in. and under	62.00 to 63.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	42.00 to 43.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	45.00 to 46.00
Malleable	50.00 to 51.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. plate	49.00 to 50.00

## Buffalo

No. 1 hvy. melting	\$45.50 to \$46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bushelings	42.75 to 43.50
No. 1 bundles	42.75 to 43.75
No. 2 bundles	41.00 to 41.50
Machine shop turn.	32.00 to 32.50
Mixed bor. and turn.	36.00 to 36.50
Shoveling turnings	36.50 to 37.00
Cast iron borings	36.50 to 37.00
Low phos. plate	48.75 to 49.75
Scrap rails, random lgth.	47.75 to 48.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.75 to 51.75
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.75 to 51.75
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	42.50 to 43.00

## Detroit

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	36.00 to 36.50
No. 1 bundles, openhearth	40.00 to 41.00
No. 2 bundles	35.00 to 36.00
Heavy turnings	34.00 to 35.00
New busheling	39.00 to 40.00
Drop forge flashings	39.00 to 40.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	42.00 to 43.00
Low phos. punch'gs, plate, heavy	46.00 to 46.50
Low phos. punch'gs, plate, light	42.00 to 43.00
No. 1 cupola cast.	47.00
Heavy breakable cast.	44.00
Stove plate	42.00
Automotive cast.	50.00

## St. Louis

No. 1 hvy. melting	\$41.50 to \$42.50
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundled sheets	36.50 to 37.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	30.00 to 31.00
Rails, random lengths	51.00 to 52.00
Rails 18 in. and under	58.00 to 60.00
Locomotive tires, uncut.	48.00 to 49.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	55.00 to 56.00
RR. spring steel	48.00 to 49.00
Cupola cast.	45.00 to 46.00
Hvy. breakable cast.	35.00 to 36.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	38.00 to 40.00
Cast iron car wheels	47.00 to 48.00
Malleable	40.00 to 41.00
Unstripped motor blocks	35.00 to 36.00

## New York

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 bundles	31.00 to 32.00
Low phos. 2 ft and less	41.00 to 42.00
Machine shop turn.	22.50 to 23.50
Mixed bor. and turn.	22.50 to 23.50
Shoveling turnings	26.50 to 27.50
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast.	45.00 to 46.00
Mixed yard cast.	39.00
Charging box cast.	39.00 to 41.00
Heavy breakable cast.	39.00 to 41.00
Unstripped motor blocks	30.00 to 31.00

## Birmingham

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	26.00 to 27.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Electric furnace bundles	39.00 to 40.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	46.00 to 47.00
Rails, 18 in. and under	46.00 to 47.00
Angles & splice bars	46.00 to 47.00
Std. steel axles	51.50 to 53.50
No. 1 cupola cast.	42.00 to 43.00
Stove plate	38.00 to 39.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	36.00 to 37.00
Heavy breakable	33.00 to 34.00
Unstripped motor blocks	34.00 to 35.00
Mashed tin cans	24.00 to 25.00

## Boston

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.17
No. 2 hvy. melting	33.17
No. 1 bundles	34.17
No. 2 bundles	30.17
No. 1 busheling	34.17
Machine shop turn.	21.00
Mixed bor. and short turn.	21.00
Shoveling turnings	25.00
Clean cast chem. borings	31.17
Mixed cupola cast.	\$32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	31.00 to 32.00
Unstripped motor blocks	28.25

## Cincinnati

No. 1 hvy. melting	\$44.50 to 45.50
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.50 to 45.50
No. 2 bundles	39.00 to 40.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	49.00 to 50.00
Rails, random lengths	51.00 to 52.00
Rails, 18 in. and under	58.00 to 59.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	49.00 to 50.00

## San Francisco

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	29.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turn.	12.00
Cast iron borings	16.00
No. 1 RR. hvy. melting	27.00
No. 1 cupola cast.	38.00

## Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	24.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Mach. shop turn.	12.00
Shoveling turnings	16.00
Cast iron borings	16.00
Elec. fur. 1 ft and under	33.00
No. 1 RR. hvy. melting	37.00
No. 1 cupola cast.	39.00

## Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 cupola cast.	37.00
Mixed yard cast.	36.00

## Hamilton, Ont.

No. 1 hvy. melting	\$35.50
No. 1 bundles	35.50
No. 2 bundles	35.50
Mechanical bundles	33.50
Mixed steel scrap	31.50
Bushelings	30.50
Bush., new fact. prep'd.	32.50
Bush., new fact. unprep'd.	32.50
Short steel turnings	32.50
Mixed bor. and turn.	32.50
Rails, remelting	35.50
Rails, rerolling	44.50
Cast scrap	50.00

# For the Purchase or Sale of Iron and Steel Scrap...

## CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests ...

Since 1889, Luria Brothers & Company, Inc. have made fair dealings their constant aim.

### CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE  
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PLANTS  
LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN  
READING, PENNA. MODENA, PENNA. PITTSBURGH, PENNA.  
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BIRMINGHAM, ALA. DETROIT, MICH. PITTSBURGH, PENNA.  
BOSTON, MASS. HOUSTON, TEXAS PUEBLO, COLORADO  
BUFFALO, N. Y. LEBANON, PENNA. READING, PENNA.  
CHICAGO, ILLINOIS LOS ANGELES, CAL. ST. LOUIS, MO.  
CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.  
SEATTLE, WASH.

## LEADERS IN IRON AND STEEL SCRAP SINCE 1889

April 9, 1953

177

## Comparison of Prices

(Effective Apr. 7, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Apr. 7 1953	Mar. 31 1953	Mar. 10 1953	Apr. 8 1953
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga.)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
<b>Tin and Terplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. terms	7.75	7.75	7.75	7.50
<b>Bars and shapes: (per pound)</b>				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	\$1.50†	\$1.50†	\$1.50†	\$1.50
Wrought iron bars	10.05	10.05	10.05	9.50
<b>Wire: (per pound)</b>				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$3.775	\$3.775	\$3.775	\$3.60
Light rails	4.25	4.25	4.25	4.00
<b>Semi-finished Steel: (per net ton)</b>				
Re-rolling billets	\$59.00	\$59.00	\$59.00	\$56.00
Slabs, re-rolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

† Add 4.7 pct to base and extras.

Composite: (per pound)

Finished steel base price ..... 4.376¢ 4.376¢ 4.376¢ 4.131¢

	Apr. 7 1953	Mar. 31 1953	Mar. 10 1953	Apr. 8 1953
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$40.60	\$40.60	\$40.60	\$37.97
Foundry, Valley	\$5.00	\$5.00	\$5.00	\$2.50
Foundry, Southern, Cin'ti	\$5.93	\$5.93	\$5.93	\$5.35
Foundry, Birmingham	\$1.38	\$1.38	\$1.38	\$1.38
Foundry, Chicago†	\$5.00	\$5.00	\$5.00	\$4.50
Basic del'd Philadelphia	\$9.77	\$9.77	\$9.77	\$7.50
Basic, Valley furnace	\$4.50	\$4.50	\$4.50	\$2.50
Malleable, Chicago†	\$5.00	\$5.00	\$5.00	\$2.50
Malleable, Valley	\$5.00	\$5.00	\$5.00	\$2.50
Ferromanganese†	226.25	226.25	226.25	184.25

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy pages.

Composite: (per gross ton)

Pig iron	\$55.26	\$55.26	\$55.26	\$52.73
<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$44.75	\$44.75	\$44.75	\$43.00*
No. 1 steel, Phila. area	43.50	44.50	44.00	41.50*
No. 1 steel, Chicago	43.50	43.50	43.50	41.50*
No. 1 bundles, Detroit	40.50	40.50	40.50	41.15*
Low phos., Youngstown	49.50	49.50	48.50	46.50*
No. 1 mach'y cast, Pittsburgh	51.50	52.50	52.50	52.75
No. 1 mach'y cast, Philadel'a	48.00	49.00	50.50	52.00*
No. 1 mach'y cast, Chicago	47.00	46.00	47.50	47.00

\* Basing pt., less broker's fee. † Shipping pt., less broker's fee. Delivered prices, including broker's fee, unless otherwise noted.

Composite: (per gross ton)

No. 1 heavy melting scrap	\$43.92	\$44.25	\$44.08	\$42.00
<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.25	17.25	17.75	17.75

**Nonferrous Metals: (cents per pound to large buyers)**

Copper, electrolytic, Conn.	\$1.50¢	\$1.00¢	\$0.75¢	\$2.50
Copper, Lake, Conn.	33.25	32.125	32.125	24.625
Zinc, Straits, New York	\$1.16½¢	\$1.20*	\$1.21½¢	\$1.21½
Zinc, East St. Louis	11.00	11.00	11.00	11.00
Lead, St. Louis	13.30	13.30	13.80	13.80
Aluminum, virgin ingot	20.50	20.50	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	30.00

† Tentative. ‡ Average. \* Revised.

## Composite Price Notes

### Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

### Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

### Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb, (2) 6000 lb or over, (3) 450 to 1499 lb, (4) 2000 to 3999 lb.

## WARE-HOUSES

Base price, f.o.b., dollars per 100 lb.

WAREHOUSES			Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
Cities	City Delivery Charge	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4015 As rolled	Hot-Rolled A 4140 As rolled	Cold-Drawn A 4015 As rolled	Cold-Drawn A 4140 As rolled	
Baltimore.....	\$.20	5.81	7.17	8.04-8.32	6.42	.....	6.05	6.47	6.41	7.18-7.43	.....	.....	.....	.....	
Birmingham.....	.15	5.80	6.65	7.70 <sup>1</sup>	5.80	.....	6.10	5.95	5.80	7.85	.....	.....	.....	.....	
Boston.....	.20	6.45	7.35	8.34	6.55	8.50 <sup>2</sup>	6.75	6.56	6.42	7.46-7.54	10.85	11.15-11.17	12.85	13.15-13.17	
Buffalo.....	.20	5.77	6.60	8.31	6.00	.....	6.30	6.08	5.78	6.95	10.70	11.00	12.70	13.00-13.07	
Chicago.....	.20	5.80	6.65	7.90	5.83	.....	5.95	5.95	5.83	6.56-6.80	.....	10.65	.....	12.65	
Cincinnati.....	.15	5.81	6.65	7.90	5.84	.....	6.00	6.00	5.83	6.56	.....	11.07	.....	13.07	
Cleveland.....	.20	5.80	6.65	8.04	6.00	.....	6.12	6.28	5.89	6.66	.....	10.79	.....	12.79	
Denver.....		5.81	6.65	7.90	6.01	.....	6.17	6.17	5.89	6.90	.....	.....	.....	.....	
Detroit.....	.20	7.17	8.23	9.60	7.43	8.90	7.37	7.50	7.61	8.24	.....	.....	.....	.....	
Houston.....	.20	7.39	8.59	9.60	7.69	.....	7.54	7.80	7.71	8.48	.....	.....	.....	.....	
Kansas City.....	.20	5.99	6.81	8.59	6.13	7.29	6.45	6.42	6.12	7.10	10.72	11.35	13.00	13.90	
Los Angeles.....	.20	6.00	6.90	8.59	6.34	7.85	6.47	6.69	6.47	7.23	.....	11.90	11.35	13.00	
Memphis.....	.10	6.35	7.00	8.67	6.70	.....	6.60	6.60	6.75	9.00	.....	11.90	11.35	13.00	
Milwaukee.....	.20	6.74	7.78	8.70	6.95	.....	6.85	6.82	7.00	9.35	.....	11.90	11.35	13.00	
New Orleans.....	.15	6.47	7.31	8.62	6.51	.....	6.62	6.62	6.50	7.57	.....	11.32	.....	12.65	
New York.....	.30	6.60	8.45	9.50	6.70	9.15	6.70	6.60	6.60	8.35	.....	12.05	.....	14.00	
Norfolk.....	.20	6.56	7.40	.....	6.98	.....	6.71	6.71	6.59	7.77	.....	.....	.....	.....	
Philadelphia.....	.25	5.97	6.82	8.07	6.00	.....	6.12	6.12	6.00	6.83	.....	10.82	.....	12.82	
Pittsburgh.....	.20	6.16	7.12	.....	6.29	.....	6.36	6.31	6.19	8.07	.....	.....	.....	.....	
Portland.....	.20	6.28	7.12	.....	6.32	8.32	6.43	6.43	6.31	7.85	.....	.....	.....	.....	
Salt Lake City.....	.20	6.11	7.27	8.07	6.56	8.94	6.60	6.34	6.59	7.46	10.68	10.91	12.67	12.97	
San Francisco.....	.15	6.62	7.41	8.58	6.72	.....	6.88	6.70	6.79	7.53	10.74	11.04	12.74	13.04	
Seattle.....	.20	6.75	7.30	.....	7.30	.....	6.65	6.65	6.55	8.30	.....	.....	.....	.....	
St. Louis.....	.20	6.11	7.13	7.95	6.45	.....	6.24	6.17	6.42	7.45	.....	10.67	.....	12.79	
St. Paul.....	.15	5.80	6.65	7.90	5.94	.....	6.28	6.17	6.42	7.45	.....	10.79	.....	12.85	
		5.81	6.65	7.90	5.97	.....	5.95	5.95	5.83	6.66	.....	10.65	.....	12.65	
		7.80	9.05	9.15	7.60	.....	6.00	6.00	6.90	9.40	.....	.....	.....	.....	
		8.30	.....	10.90 <sup>3</sup>	8.45	.....	7.30	7.30	7.35	9.40	.....	.....	.....	.....	
		6.90	8.20	9.50	6.75	9.25	6.75	6.50	6.65	8.40	.....	12.05	.....	14.00	
		7.16	8.24	9.20	7.20	.....	7.04	6.63	6.88	9.37	.....	11.70	.....	13.70	
		7.36	8.84	9.50	7.45	.....	7.19	6.83	7.08	9.42	.....	10.65	10.95	12.65	
		6.10	6.94	8.20	6.14	8.27	6.35	6.35	6.13	6.96	.....	.....	.....	.....	
		6.11	6.95	.....	6.11	.....	6.39	6.40	.....	7.21	.....	.....	.....	.....	
		6.47	7.31	8.61	6.50	.....	6.61	6.61	6.49	7.32	.....	11.31	.....	.....	
			7.61	.....	.....	.....	6.66	.....	.....	7.57	.....	.....	.....	.....	

Apr. 6  
1962  
\$57.97  
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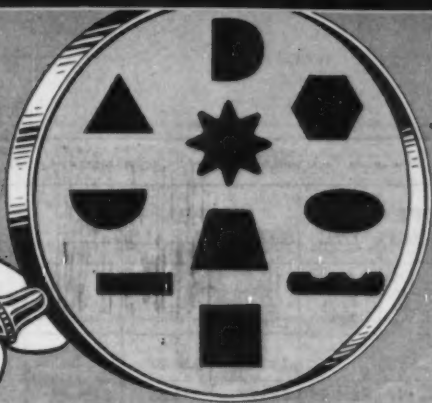
per 100 lb.

As Made  
Cold-Drawn  
Annealed

13.15-  
13.18  
13.08-  
13.07  
12.45  
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12.79  
12.42-  
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13.90  
14.60  
12.82  
12.97-  
13.04  
12.79  
12.65

14.00  
13.70  
12.95

AGE



# THE SHAPE

## OF THINGS TO COME...

Why burden yourself with production and labor problems caused by the need for machined or cast parts that may be damaged in handling . . . or in product use. You can shift these responsibilities and save money too, by using Continental shaped wire. Save the dollars you are now spending for high priced labor, throw-outs, jigs, fixtures and expensive machine tools. Continental is geared for wire production for you—producing finished, sturdy shaped wire for production parts . . . either functional or for eye-appealing trim, in practically any wire shape or size. Join the enthusiastic users of Continental wire . . . users who talk with Continental about their wire problems. Just write or wire Continental . . . without obligation, and benefit from interested, personalized wire service.

### Which 'CONTINENTAL' Wire Shape Fits Your Current or Coming Product Needs?

Unless you check up on shaped wire you may continue to buy unnecessarily expensive forgings, stampings or rollings. Our experience with a host of wire users prepares us to help you solve your component-parts, or product-trim problems. It's easy to find out if we can be of help to you . . . just call or write us at Kokomo, Indiana.

- |                                  |                                  |
|----------------------------------|----------------------------------|
| Small Gears                      | Staples                          |
| Bright Wire Trim                 | Barbeque Grilles                 |
| Key Wrenches                     | Bed Spring Border and Brace Wire |
| Control Rods for Venetian Blinds | Welding Electrodes               |
| Garment Hangers                  | Cotter Pin Wire                  |
| Stove and Refrigerator Shelves   | Small Cams                       |
| Buckles                          | Costume Jewelry                  |
| Loose Leaf Binders               | Tie Racks                        |

\*Trade Mkr. Reg. U. S. Pat. Off.

**CONTINENTAL  
STEEL**

# CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF Manufacturer's Wire in many sizes, gauges, tempers and finishes, including Galvanized,

KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire.

ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.



IRON AGE		Italics identify producers listed in key at end of table Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Apr. 7, 1953)		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					\$76.00 B3			3.90 B3	5.80 B3				
	Buffalo, N. Y.			\$59.00 B3	\$70.50 B3, R3	\$76.00 B3, R3		4.675 B3	3.90 B3	5.80 B3	3.725 B3, R3	5.10 B3	5.70 B3	7.90 B3
	Claymont, Del.													
	Coatesville, Pa.													
	Consabackon, Pa.				\$77.50 A2	\$83.00 A2					4.125 A2		5.90 A2	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			\$59.00 B3	\$70.50 B3	\$76.00 B3			3.90 B3	5.80 B3	3.725 B3			
	Newark, N. J.													
	New Haven, Conn.											5.60 A5 5.85 D1		
	Phoenixville, Pa.								4.95 P2					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 B3	5.10 B3	5.70 B3	7.90 B3
	Worcester, Mass.													
	Trenton, N. J.											6.45 R4		
MIDDLE WEST	Alton, Ill.										4.20 L1			
	Ashland, Ky.										3.725 A7			
	Canton-Massillon, Ohio				\$70.50 R3	\$76.00 R3 \$78.60 T5								
	Chicago, Sterling, Ill.			\$59.00 U1	\$70.50 U1, R3, W8	\$76.00 U1, R3, W8		4.675 U1	3.85 U1, W8	5.80 U1	3.725 A1, W8 4.725 N4	5.35 A1		
	Cleveland, Ohio				\$70.50 R3							5.10 A5, J3		7.45 J3
	Detroit, Mich.	\$54.00 R5	\$57.00 R5		\$73.50 R5	\$79.00 R5					4.025 G3 4.40 M2	5.30 G3 5.45 M2 5.60 D1 6.05 D2	6.30 G3	8.15 G3
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			\$59.00 U1	\$70.50 U1	\$76.00 U1, Y1		4.675 J3	3.85 J3, U1	5.80 J3, U1 6.30 Y1	3.725 J3, U1, Y1	5.35 J3	5.65 J3, U1 6.15 Y1	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 A7		
	Niles, Ohio Sharon, Pa.										4.225 S1	5.70 T4 5.80 S1	5.65 S1	7.30 S1
	Pittsburgh, Pa. Midland, Pa.	\$54.00 U1	\$57.00 U1, C11	\$59.00 U1	\$70.50 U1	\$76.00 U1, C11	3.55 U1 3.65 J3	4.675 U1	3.85 U1, J3	5.80 U1, J3	3.725 A7 3.975 A3 4.225 S7, S9	5.10 J3, A7 5.45 A3 5.80 B4, S7	7.45 J3	
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								4.10 W3		3.825 W3	5.10 W3	6.10 W3	7.95 W3
Youngstown, Ohio					\$76.00 Y1, C10	3.55 U1, R3			6.30 Y1	3.725 U1, Y1, R3	5.10 R3, Y1 5.70 C5 5.80 B4	5.65 R3, U1 6.15 Y1	7.30 R3 7.80 Y1	
WEST	Fontana, Cal.	\$81.00 K1	\$83.00 K1	\$78.00 K1	\$89.50 K1	\$95.00 K1			4.50 K1	6.45 K1	5.175 K1	6.75 K1	6.55 K1	
	Geneva, Utah				\$70.50 C7				3.85 C7	5.80 C7				
	Kansas City, Mo.								4.45 S2		4.325 S2			
	Los Angeles, Torrance, Cal.				\$89.50 B2	\$96.00 B2			4.45 C7, B2	6.35 B2	4.475 C7, B2	7.15 C1	6.40 B2	
	Minnequa, Colo.								4.30 C6		4.775 C6			
	San Francisco, Niles, Pittsburg, Cal.				\$89.50 B2				4.40 B2 4.56 P9	6.30 B2	4.475 C7, B2		6.40 B2	
	Seattle, Wash.				\$89.50 B2				4.50 B2	6.40 B2	4.725 B2		6.65 B2	
SOUTH	Atlanta, Ga.										4.275 A8			
	Fairfield, Ala. Alabama City, Ala.			\$59.00 T2	70.50 T2				3.85 T2, R3	5.80 T2	3.725 T2, R3		5.65 T2	
	Houston, Texas		\$65.00 S2		\$78.50 S2	\$84.00 S2			4.25 S2		4.125 S2			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

SHEETS

WIRE  
ROD

TINPLATE†

BLACK  
PLATE

**STEEL  
PRICES**

(Effective  
Apr. 7, 1953)

Hot-rolled 10 ga. C.R. Alloy	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.	
													Bethlehem, Pa.
7.90 B1	4.575 B3				5.675 B3	6.925 B3							Buffalo, N. Y.
										† Special coated mfg terms deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct \$2.20 from 1.25-lb coke base box. * COKE: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Claymont, Del.
					5.925 A2								Coatesville, Pa.
													Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 B3				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
7.90 B1	4.575 B3	5.675 B3			5.675 B3	6.925 B3	7.775 B3		4.425 B3	\$8.90 B3	\$7.50 B3		Sparrows Pt., Md.
									4.625 A5				Worcester, Mass.
									4.425 R4				Tranton, N. J.
									4.70 L1				Alton, Ill.
7.95 A1		5.075 A7	4.925 A7										Ashland, Ky.
		5.075 R3											Canton-Massillon, Ohio
7.95 W8					5.675 U1				4.325 A5, N4, R3				Chicago, Sterling, Ill.
7.45 J3	4.575 R3, J3		4.925 R3		5.675 R3, J3	6.925 R3, J3			4.325 A5				Cleveland, Ohio
8.15 G1	4.775 G3				6.225 G3	7.475 G3							Detroit, Mich.
													Duluth, Minn.
7.95 J3, Y1	4.575 J3, U1, Y1	5.075 J3, U1	4.925 U1	5.475 U1	5.675 J3, U1 6.175 Y1	6.925 J3, U1 7.425 Y1				\$8.70 U1, J3, Y1	\$7.40 U1, J3	6.10 U1, Y1	Gary, Ind. Harbor, Indiana
7.95 G2	5.275 G2	5.30 G2	5.625 G2								\$7.60 G2	6.30 G2	Granite City, Ill.
		5.475 C9											Kokomo, Ind.
	4.575 A7		4.925 A7	5.475 A7									Middletown, Ohio
7.90 S1					5.675 S1						\$7.40 R3		Niles, Ohio Sharon, Pa.
7.95 U1, A1 A3	4.575 U1, J3, A7	5.075 U1	4.925 U1		5.675 U1, J3	6.925 U1, J3	7.625 U1		4.325 A5 4.525 P6	\$8.70 U1, J3	\$7.40 U1, J3	6.10 U1	Pittsburgh, Pa. Midland, Pa.
									4.525 P7				Portsmouth, Ohio
7.95 W3	4.575 W3, W3	5.075 W3, W3		5.475 W3, W3	6.025 W3	7.275 W3				\$8.70 W3, W3	\$7.40 W3, W3	6.35 W3	Weirton, Wheeling, Follansbee, W. Va.
7.90 Y1, Y1	4.575 R3, Y1	5.775 R1	4.925 Y1	6.05 E2	5.675 R3, U1 6.175 Y1	6.925 R3 7.425 Y1		5.65 E2 5.825 R1	4.325 Y1	\$8.70 R3			Youngstown, Ohio
7.95 K1	5.675 K1				6.775 K1	7.875 K1			5.125 K1				Fontana, Cal.
7.95 C7													Geneva, Utah
													Kansas City, Mo.
7.95 C7		5.825 C7						5.575 C7	5.125 C7, B2				Los Angeles, Torrance, Cal.
									4.575 C6				Minnequa, Colo.
7.95 C7	5.525 C7	5.825 C7							4.975 C7	\$9.45 C7	\$8.15 C7		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
7.95 T2	4.575 T2	5.075 T2, R3			5.675 T2			4.925 R3	4.325 T2, R3	\$8.80 T2	\$7.50 T2		Fairfield, Ala. Alabama City, Ala.
									4.725 S2				Houston, Tex.

IRON AGE		<i>Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.</i>										
	<b>STEEL PRICES</b> (Effective Apr. 7, 1953)	BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing (To Fabricators)	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.675 B3	6.00 B3	5.925 B3					
	Buffalo, N. Y.	3.95 B3, R3	3.95 B3, R3	4.975 B5	4.675 B3, R3	6.00 B3, B5	5.925 B3	3.90 B3			5.95 B3	
	Claymont, Del.							4.35 C4		5.35 C4		
	Coatesville, Pa.							4.35 L4		5.75 L4		
	Conschocken, Pa.							4.35 A2	4.95 A2		6.20 A2	
	Harrisburg, Pa.							6.50 C3	6.50 C3			
	Hartford, Conn.			5.475 R3		6.45 R3						
	Johnstown, Pa.	3.95 B3	3.95 B3		4.675 B3		5.925 B3	3.90 B3		5.25 B3	5.95 B3	5.225 B3
	Newark, N. J.			5.375 W10		6.35 W10						
	New Haven, Conn.											
	Camden, N. J.			5.375 P10		6.35 P10						
	Putnam, Conn.			5.475 W10								
	Sparrows Pt., Md.		3.95 B3					3.90 B3		5.25 B3	5.95 B3	5.325 B3
	Worcester, Mass.					6.35 A5						5.525 A5
MIDDLE WEST	Trenton, N. J.											
	Alton, Ill.	4.50 L1										5.45 L1
	Ashland, Ky.							3.90 A7				
	Canton-Massillon	3.95 R3		4.925 R2, R3	4.675 R3 4.72 T5	5.99 T5 6.00 R2, R3						
	Chicago, Sterling, Ill.	3.95 U, W8, R3 4.55 N4	3.95 R3 4.70 N4	4.925 A5, B5 W8, W10	4.675 R3, U1, W8	6.00 B5, L2, R3, W8, W10 6.05 A5		3.90 U1, W8	4.95 U1	5.25 U1	5.95 U1	5.225 A3, N4, R3 5.325 K2 5.475 W7
	Cleveland, Ohio	3.95 R3	3.95 R3	4.925 A5, C13		6.00 C13 6.05 A5	5.925 R3	3.90 R3, J3	4.95 J3		5.95 R3, J3	5.225 A5, C13, R3
	Detroit, Mich.	4.10 R5 4.30 G3		5.075 R5, P8 5.175 P3	4.825 R5 5.025 G3	6.15 R5, P8 6.20 P3	6.675 G3	4.45 G3			6.80 G3	
	Duluth, Minn.											5.252 A5
	Gary, Ind. Harbor, Crawfordsville, Indiana	3.95 J3, U1, Y1	3.95 J3, U1, Y1	4.925 L2, M5, R3	4.675 J3, U1, Y1	6.00 L2, M5, R3, R5	5.925 J3, U1, 6.425 Y1	3.90 J3, U1, Y1	4.95 J3	5.25 U1	5.95 J3, U1, 6.45 Y1	5.325 N4
	Granite City, Ill.							4.60 G2				
	Kokomo, Ind.											5.325 C9
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							4.15 S1		5.70 S1	5.95 S1	
	Pittsburgh, Pa. Midland, Pa.	3.95 U1, J3	3.95 U1, J3	4.925 A5, J3, W10, R3, C8	4.675 U1, C11	6.00 C8, C11, W10 6.05 A5	5.925 U1, J3	3.90 U1, J3	4.95 U1	5.25 U1	5.95 U1, J3	5.225 A5, J3 5.475 P6
	Portsmouth, Ohio											5.625 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.10 W3						3.90 W5 4.20 W3				
	Youngstown, Ohio	3.95 U1, Y1, R3	3.95 U1, Y1, R3	4.925 F2, Y1	4.675 U1, C10, Y1	6.00 C10, F2, Y1	5.925 U1 6.425 Y1	3.90 U1, Y1, R3			5.95 R3 6.45 Y1	5.225 Y1
WEST	Fontana, Cal.	4.65 K1	4.65 K1		5.725 K1		6.975 K1	4.55 K1		6.20 K1	6.65 K1	
	Geneva, Utah							3.90 C7			5.95 C7	
	Kansas City, Mo.	4.55 S2	4.55 S2		5.275 S2						5.825 S1	
	Los Angeles, Torrance, Cal.	4.65 C7, B2	4.65 C7, B2	6.375 R3	5.725 B2		6.625 B2				6.175 C7, B1	
	Minnequa, Colo.	4.40 C6	4.75 C6					4.70 C6				5.475 C6
	San Francisco, Niles, Pittsburg, Cal.	4.65 C7, P9 4.70 B2	4.65 C7, P9 4.70 B2				6.675 B2					6.175 C6, C7
	Seattle, Wash.	4.70 B2	4.70 B2				6.675 B2	4.50 B2			6.85 B2	
SOUTH	Atlanta, Ga.	4.50 A8	4.50 A8									5.475 A8
	Fairfield, Ala. Alabama City, Ala.	3.95 T2, R3	3.95 T2, R3				5.925 T2	3.90 T2, R3			5.95 T2	5.225 T2, R3
	Houston, Texas Ft. Worth, Texas	4.35 S2	4.35 S2 5.85 T7		5.075 S2			4.30 S2				5.625 S2

# Steel Prices

(Effective Apr. 7, 1953)

## Key to Steel Producers

With Principal Offices

- A1** Acme Steel Co., Chicago  
**A2** Alan Wood Steel Co., Conshohocken, Pa.  
**A3** Allegheny Ludlum Steel Corp., Pittsburgh  
**A4** American Clad Metals Co., Carnegie, Pa.  
**A5** American Steel & Wire Div., Cleveland  
**A6** Angell Nail & Chaplet Co., Cleveland  
**A7** Armco Steel Corp., Middletown, O.  
**A8** Atlantic Steel Co., Atlanta, Ga.  
  
**B1** Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
**B2** Bethlehem Pacific Coast Steel Corp., San Francisco  
**B3** Bethlehem Steel Co., Bethlehem, Pa.  
**B4** Blair Strip Steel Co., New Castle, Pa.  
**B5** Bliss & Laughlin, Inc., Harvey, Ill.  
  
**C1** Calstrip Steel Corp., Los Angeles  
**C2** Carpenter Steel Co., Reading, Pa.  
**C3** Central Iron & Steel Co., Harrisburg, Pa.  
**C4** Claymont Products Dept., Claymont, Del.  
**C5** Cold Metal Products Co., Youngstown  
**C6** Colorado Fuel & Iron Corp., Denver  
**C7** Columbia-Geneva Steel Div., San Francisco  
**C8** Columbia Steel & Shifting Co., Pittsburgh  
**C9** Continental Steel Corp., Kokomo, Ind.  
**C10** Copperweld Steel Co., Glassport, Pa.  
**C11** Crucible Steel Co. of America, New York  
**C12** Cumberland Steel Co., Cumberland, Md.  
**C13** Cuyahoga Steel & Wire Co., Cleveland  
  
**D1** Detroit Steel Corp., Detroit  
**D2** Detroit Tube & Steel Div., Detroit  
**D3** Driver Harris Co., Harrison, N. J.  
**D4** Dickson Weatherproof Nail Co., Evanston, Ill.  
  
**E1** Eastern Stainless Steel Corp., Baltimore  
**E2** Empire Steel Co., Mansfield, O.  
  
**F1** Firth Sterling, Inc., McKeesport, Pa.  
**F2** Fiximons Steel Corp., Youngstown  
**F3** Follansbee Steel Corp., Follansbee, W. Va.  
  
**G1** Globe Iron Co., Jackson, O.  
**G2** Granite City Steel Co., Granite City, Ill.  
**G3** Great Lakes Steel Corp., Detroit  
  
**H1** Hanna Furnace Corp., Detroit  
  
**I2** Ingersoll Steel Div., Chicago  
**I3** Inland Steel Co., Chicago  
**I4** Interlake Iron Corp., Cleveland  
  
**J1** Jackson Iron & Steel Co., Jackson, O.  
**J2** Jessop Steel Corp., Washington, Pa.  
**J3** Jones & Laughlin Steel Corp., Pittsburgh  
**J4** Jowly Mfg. & Supply Co., Chicago  
  
**K1** Kaiser Steel Corp., Fontana, Cal.  
**K2** Keystone Steel & Wire Co., Peoria  
**K3** Koppers Co., Granite City, Ill.  
  
**L1** Laclede Steel Co., St. Louis  
**L2** La Salle Steel Co., Chicago  
**L3** Lone Star Steel Co., Dallas  
**L4** Lukens Steel Co., Coatesville, Pa.  
  
**M1** Mahoning Valley Steel Co., Niles, O.  
**M2** McLouth Steel Corp., Detroit  
**M3** Mercer Tube & Mfg. Co., Sharon, Pa.  
**M4** Mid-States Steel & Wire Co., Crawfordsville, Ind.  
**M5** Monarch Steel Co., Inc., Hammond, Ind.  
**M6** Mystic Iron Works, Everett, Mass.  
  
**N1** National Supply Co., Pittsburgh  
**N2** National Tube Co., Pittsburgh  
**N3** Niles Rolling Mills Co., Niles, O.  
**N4** Northwestern Steel & Wire Co., Sterling, Ill.  
  
**O1** Oliver Iron & Steel Co., Pittsburgh  
  
**P1** Page Steel & Wire Div., Monessen, Pa.  
**P2** Phoenix Iron & Steel Co., Phoenixville, Pa.  
**P3** Pilgrim Drawn Steel Div., Plymouth, Mich.  
**P4** Pittsburgh Coke & Chemical Co., Pittsburgh  
**P5** Pittsburgh Screw & Bolt Co., Pittsburgh

- P6** Pittsburgh Steel Co., Pittsburgh  
**P7** Portsmouth Div., Detroit Steel Corp., Detroit  
**P8** Plymouth Steel Co., Detroit  
**P9** Pacific States Steel Co., Niles, Cal.  
**P10** Precision Drawn Steel Co., Camden, N. J.  
  
**R1** Reeves Steel & Mfg. Co., Dover, O.  
**R2** Reliance Div., Eaton Mfg. Co., Massillon, O.  
**R3** Republic Steel Corp., Cleveland  
**R4** Roebbing Sons Co. (John A.), Trenton, N. J.  
**R5** Rotary Electric Steel Co., Detroit  
  
**S1** Sharon Steel Corp., Sharon, Pa.  
**S2** Sheffield Steel Corp., Kansas City  
**S3** Shamango Furnace Co., Pittsburgh  
**S4** Simonds Saw & Steel Co., Fitchburg, Mass.  
**S5** Sloss Sheffield Steel & Iron Co., Birmingham  
**S6** Standard Forging Corp., Chicago  
**S7** Stanley Works, New Britain, Conn.  
**S8** Superior Drawn Steel Co., Monaca, Pa.  
**S9** Superior Steel Corp., Carnegie, Pa.  
**S10** Sweet's Steel Co., Williamsport, Pa.  
**S11** Seidelhuber Steel Rolling Mills, Seattle  
  
**T1** Tonawanda Iron Div., N. Tonawanda, N. Y.  
**T2** Tennessee Coal & Iron Div., Fairfield  
**T3** Tennessee Products & Chem. Corp., Nashville  
**T4** Thomas Strip Div., Warren, O.  
**T5** Timken Steel & Tube Div., Canton, O.  
**T6** Tremont Nail Co., Warham, Mass.  
**T7** Texas Steel Co., Ft. Worth  
  
**U1** United States Steel Co., Pittsburgh  
**U2** Universal-Cyclops Steel Corp., Bridgeville, Pa.  
  
**W1** Wallingford Steel Co., Wallingford, Conn.  
**W2** Washington Steel Corp., Washington, Pa.  
**W3** Weirton Steel Co., Weirton, W. Va.  
**W4** Wheatland Tube Co., Wheatland, Pa.  
**W5** Wheeling Steel Corp., Wheeling, W. Va.  
**W6** Wickwire Spencer Steel Div., Buffalo  
**W7** Wilson Steel & Wire Co., Chicago  
**W8** Wisconsin Steel Co., S. Chicago, Ill.  
**W9** Woodward Iron Co., Woodward, Ala.  
**W10** Wychoff Steel Co., Pittsburgh  
  
**Y1** Youngstown Sheet & Tube Co., Youngstown

## MERCHANT WIRE PRODUCTS

	Standard & Coated Nails	Wire Wire	Fence 9-15 1/2 ga.	Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann Id	Merch. Wire Galv.
F.a.b. Mill	Coil	Coil	Coil	Coil	Coil	Coil	Coil	Coil	Coil
Alabama City R31	127	135	132	144	6.075	6.325			
Aliquippa, Pa. J3	127	141	135	148	6.075	6.525			
Atlanta A8	130	140	135	149	6.325	6.675			
Bartonville K2	127	139	140	132	148	6.075	6.50		
Buffalo W6	127	136	132	145	145	6.075	6.375		
Chicago W6	127	136	132	145	145	6.075	6.375		
Cleveland A6	127	136	132	145	145	6.075	6.375		
Cleveland A5	127	136	132	145	145	6.075	6.375		
Crawfordsville M4	127	133	132	142	142	6.075	6.225		
Danvers, Pa. A5	127	133	132	142	142	6.075	6.225		
Dubuoh A5	127	133	132	142	142	6.075	6.225		
Fairfield, Ala. T2	127	133	132	142	142	6.075	6.225		
Galveston D4	135	147	140	149	156	6.475	6.925		
Houston S2	135	147	140	149	156	6.475	6.925		
Johnston, Pa. B3	127	133	132	142	142	6.075	6.225		
Joliet, Ill. A5	127	133	132	142	142	6.075	6.225		
Kokomo, Ind. C9	127	133	132	142	142	6.075	6.225		
Los Angeles B2	127	133	132	142	142	6.075	6.225		
Kansas City S2	139	144	140	149	156	6.475	6.925		
Minnequa C6	132	146	138	137	153	6.325	6.70		
Moline, Ill. R3	127	133	132	142	142	6.075	6.225		
Pittsburgh, Cal. C7	146	154	156	162	162	7.025	7.175		
Monessen P6	127	138	147	147	147	6.075	6.45		
Portsmouth P7	132	133	142	142	142	6.075	6.225		
Rankin, Pa. A5	127	133	132	142	142	6.075	6.225		
So. Chicago R31	127	135	140	132	144	6.075	6.325		
S. San Fran. C6	127	133	132	142	142	6.075	6.225		
Sparrows Pt. B3	129	134	151	151	151	6.075	6.475		
Struthers, O. Y11	127	133	132	142	142	6.075	6.225		
Torrance, Cal. C7	147	153	153	167	167	7.025	7.40		
Worcester A5	133	133	133	133	133	6.375	6.525		
Williamsport, Pa. S10	133	133	133	133	133	6.375	6.525		

Cut Nails, carloads base \$7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (A2) Wheeling, W. Va (W3) \$7.80.  
 † Zinc extra not included on Galv. Merch. Wire.  
 ‡ Struthers Galv. Merch. Wire based on 15¢ Zinc.

## STAINLESS STEELS

Base price, cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingot, re-rolling	15.50	16.50	18.00	17.50	26.75	21.75	23.50	13.50	16.25	13.75
Slabs, billets, re-rolling	19.75	21.75	23.75	22.75	34.75	28.25	30.75	17.50	21.50	17.75
Forg. discs, die blocks, rings	36.75	37.00	39.75	38.50	57.25	43.50	48.25	30.00	30.50	30.50
Billets, forging	28.25	28.50	30.75	29.75	44.75	33.75	37.75	23.00	23.50	23.50
Bars, wires, structurals	33.75	34.00	36.50	35.50	53.00	40.00	44.75	27.50	28.00	28.00
Plates	35.75	35.75	38.00	38.00	54.00	44.00	49.00	28.75	29.75	29.25
Sheets	44.25	44.50	46.50	46.50	61.50	53.00	58.00	39.00	39.50	41.50
Strip, hot-rolled	28.50	30.50	35.00	32.75	52.50	40.00	44.50	25.00	32.75	25.75
Strip, cold-rolled	36.50	39.75	43.50	41.75	63.50	52.00	56.50	32.75	39.50	33.25

**STAINLESS STEEL PRODUCING POINTS**—Sheets: Midland, Pa., C11; Bechenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J3; Baltimore, Md., E1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U3; New Castle, Ind., I2; Ft. Wayne, Ind., J4; Lockport, N. Y., R4.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2 (type 316 add 4.5¢); W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Md., M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, Pa., C3; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add 1/4¢); Butler, Pa., A7; Wallingford, Conn., W1.

Bars: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ill., S4; Canton, O., T5; Ft. Wayne, Ind., J4.

Wires: Waukegan, Ill., S4; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, Pa., P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Bechenridge, Pa., A3; Butler, Pa., A7; Chicago, Ill., U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Lockport, N. Y., S4; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.

**WASHINGTON STEEL**—Slightly lower on 300 series except where noted.

# Miscellaneous Prices

(Effective Apr. 7, 1953)

## PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$280 per net ton.

	BUTTWELD														SEAMLESS					
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2-3 In.		3 1/2-4 In.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. B3	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25						
Youngstown R3	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Fontana K1	19.5	+2.75	22.5	1.25	25.0	4.75	25.5	5.25	26.0	6.25	26.5	6.75	27.0	7.25						
Pittsburgh J3	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. L1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Sharon M3	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25						
Pittsburgh N1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0		27.0		29.0	
Wheeling W5	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Wheeland W4	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75						
Youngstown Y1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	6.75
Indiana Harbor Y1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Lorain N2	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	6.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5						
Youngstown R3	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Fontana K1	19.25		23.25		25.25		25.75		26.25		26.75		27.25							
Pittsburgh J3	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. L1	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5						
Sharon M3	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5						
Pittsburgh N1	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75		27.75		31.25	
Wheeling W5	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Wheeland W4	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0						
Youngstown Y1	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor Y1	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5						
Lorain N2	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb. East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt-weld and seamless, 1 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 3/4 pts. higher discount. Butt-weld jobbers' discount, 5 pct. St. Louis zinc price now 11.9¢.

## COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	26.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.66
St. Paul, f.o.b.	22.50
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

## ELECTRICAL SHEETS

22 Ga. H-R cut length	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.o.b. Mill Cents Per Lb.							
Beach Bottom W5	7.85	9.10	9.90	10.45	11.00	11.70	
Brackenridge A3	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City G2	8.55	9.80					
Ind. Harbor J3	7.35	7.85	9.10				
Mansfield E2	7.35	7.85	9.10	9.90			
Niles, O. A3	7.35	7.85					
Vandergrift U1	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. R3	7.35	7.85	9.10				
Zanesville A7	7.35	7.85	9.10	9.90	10.45	11.00	11.70

## CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	\$110.30 to \$113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in., Birmingham	96.50 to 101.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$128.00 to \$130.00
Class "A" and gas pipe, 5¢ extra; 4-in. pipe is \$5 a ton above 6-in.	

## BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	23.93	28.14	23.19	27.28
	2 1/2	12	32.17	37.83	31.19	36.47
	2	12	35.78	42.11	34.60	40.82
	3 1/2	11	44.72	52.65	43.36	51.85
	4	10	55.52	65.31	63.83	63.32
National Tube	2	13	22.81	27.94	22.23	
	2 1/2	12	31.28	38.31	30.51	
	3	12	35.87	43.93	34.98	
	3 1/2	11	42.56	52.12		
	4	10	54.02	66.16		
Pittsburgh Steel	2	13		28.50		
	2 1/2	12	32.16	39.19		
	3	12	36.87	44.93		
	3 1/2	11	43.70	53.32		
	4	10		67.68		

## C-R SPRING STEEL

		CARBON CONTENT				
		Cents Per Lb. F.o.b. Mill				
		0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7	5.80	7.65	8.25	10.20	12.50	
Carnegie, Pa. S9		7.65	8.25	10.20	12.50	
Cleveland A5	5.10	7.30	8.25	10.20	12.50	
Detroit D1	6.45	7.50	8.10			
New Castle, Pa. B4	5.80	7.65	8.25	10.20		
New Haven, Conn. D1	6.70	7.60	8.20			
Sharon, Pa. S1	5.90	7.65	8.25	10.20	12.50	
Trenton, N. J. R4		7.95	8.55	10.50	12.80	
Warren, Ohio T4	6.20	7.65	8.25	10.20	12.50	
Weirton, W. Va. W3	5.80	7.65	8.25	10.20	12.50	
Worcester, Mass. A5	5.40	7.60	8.55	10.50	12.80	
Youngstown C5		7.65	8.25	10.20	12.50	

\* Sold on Pittsburgh base.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bothlehem B3	56.50	57.00	57.50	58.00		
Birmingham R3	50.88	51.38				
Birmingham W9	50.88	51.38				
Birmingham S3	50.88	51.38				
Buffalo R3	54.50	55.00	55.50			
Buffalo H1	54.50	55.00	55.50			66.75
Buffalo W6	54.50	55.00	55.50			
Chicago I4	54.50	55.00	55.00	55.50		
Cleveland A5	54.50	55.00	55.00	55.50	59.50	
Cleveland R3	54.50	55.00	55.00			
Dalingerfield, Tex. L3	50.50	51.00	51.00			
Duluth I4	54.50	55.00	55.00	55.50		
Erie I4	54.50	55.00	55.00	55.50		
Everett, Mass. M6		59.50	60.00			
Fontana K1	60.50	61.00				
Genova, Utah C7	54.50	55.00				
Granite City, Ill. K3	56.40	56.90	57.40			
Hubbard, Ohio Y1	54.50	55.00				
Jackson, Ohio J1, G1						65.50
Minnequa C6	56.50	57.50	57.50			
Monessen P6	56.50					
Neville Island P4	54.50	55.00	55.00	55.50		
Pittsburgh U1	54.50			55.50		
Sharpsville S3	54.50	55.00	55.00	55.50		
Steelton B3	56.50	57.00	57.50	58.00	62.50	
Swedeland A2	58.50	59.00	59.50	60.00		
Toledo I4	54.50	55.00	55.00	55.50		
Troy, N. Y. R3	56.50	57.00	57.50	58.00	62.50	
Youngstown Y1	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. T1		55.00	55.50			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.20 pct and over. Silvery iron: Add \$1.50 per ton out for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

## Miscellaneous Prices

(Effective Apr. 7, 1953)

### RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Asasmer U1	3.775	4.25	4.925				
Chicago R3				6.65			
Cleveland R3	3.775	4.25					
Eastley T2		4.25		6.65		4.775	
Farley T2	3.775	4.25				4.775	
Gay U1	3.775	4.25				4.775	
Ind. Harbor B3	3.775		4.925	6.65		4.775	
Joliet U1		4.25					
Johnstown B3		4.25	4.925				
Kansas City S2							
Lackawanna B3	3.775	4.25	4.925			4.775	
Lebanon B3				6.65			
Minneapolis C6	3.775	4.75	4.925	6.65		4.775	9.85
Pittsburgh R3							
Pittsburgh O1							
Pittsburgh P5							
Pittsburgh J3				6.65			
Plt'g, Cal. C7						4.925	
Seattle B2				7.15		4.925	
Steelton B3	3.775		4.925			4.775	
Struthers Y1				6.65			
Terrance C7						4.925	
Youngstown R3				6.65			

### TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$15.05
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢
High-carbon chromium					63.5¢
Oil hardened manganese					35¢
Special carbon					\$2.5¢
Extra carbon					27¢
Regular carbon					23¢
Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.					

### CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Cotterville, Pa. L4	*29.5	
Washington, Pa. J2	*29.5	
Claymont, Del. C4	*29.50	
Conshohocken, Pa. A2		*27.50
New Castle, Ind. I2	*29.77	*26.24
Nickel-carbon		
10 pct Cotterville, Pa. L4	32.5	
Inconel-carbon		
10 pct Cotterville, Pa. L4	40.5	
Monel-carbon		
10 pct Cotterville, Pa. L4	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. A4		77.00
Aluminized steel sheets, hot dip, Butler, Pa., A7		7.75
*Includes annealing and pickling, or sandblasting.		

### ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
24	84	18.70
17, 18, 20	60, 72	18.70
8 to 16	48, 60, 72	18.70
7	48, 60	20.50
6	48, 60	21.95
4, 5	40	22.53
3	40	23.68
2	24, 30	24.26
1	24, 30	26.67
CARBON		
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

### FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.  
Price, net ton; Effective CaF<sub>2</sub> content:  
70% or more \$43.00  
60% or less 40.00

The manufacture of multi-product lines has always created problems for metal fabricators. While diverse metal sizes, shapes and perforations enhance product value and customer acceptance — they also add to manufacturing costs. In order to keep customers happy and keep production costs down, put Hendrick's specialized perforated metal facilities to work.

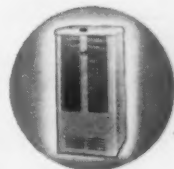
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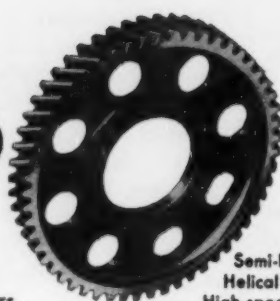
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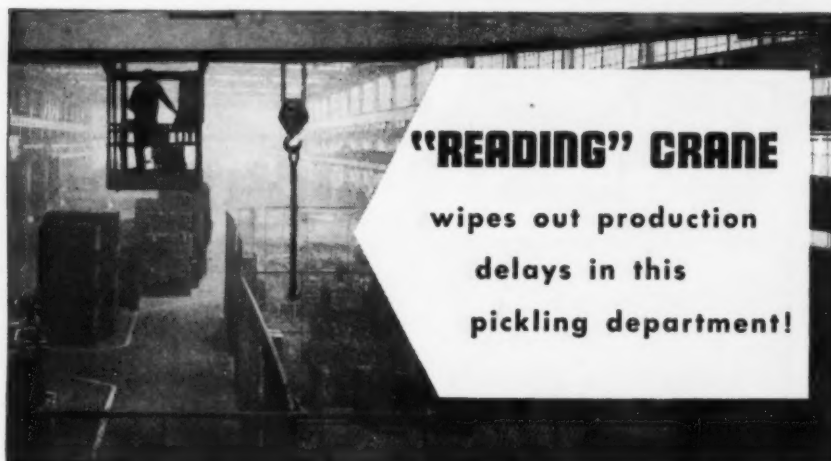
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**READING CRANES**

**Miscellaneous Prices**  
(Effective Apr. 7, 1953)  
**BOLTS, NUTS, RIVETS, SCREWS**

**Consumer Prices**

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

**Nuts, Hot Pressed, Cold Punched—Sq.**

	Pot Off List			
	Less	Reg.	Less	
	Keg	K.	Keg	K.
1/2 in. & smaller.	15	28 1/2	15	28 1/2
9/16 in. & 5/8 in.	12	25	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	9	23	1	16 1/2
1 1/2 in. & larger.	7 1/2	22	1	16 1/2

**Nuts, Hot Pressed—Hexagon**

1/2 in. & smaller.	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	12	25	2	17 1/2
1 1/2 in. & larger.	8 1/2	23	2	17 1/2

**Nuts, Cold Punched—Hexagon**

1/2 in. & smaller.	26	37	22	34
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
Inclusive	19 1/2	31 1/2	12	25
1 1/2 in. & larger.	8 1/2	23	2	17 1/2

**Nuts, Semi-Finished—Hexagon**

	Reg.		Hvy.	
1/2 in. & smaller.	35	45	28 1/2	29 1/2
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
Inclusive	24	36	15	28 1/2
1 1/2 in. & larger.	13	26	8 1/2	23
		Light		
7/16 in. & smaller.	35	45		
1/2 in. thru 5/8 in.	28 1/2	39 1/2		
3/4 in. to 1 1/2 in.				
Inclusive	26	37		

**Stove Bolts**

	Pot Off List	
Packaged, steel, plain finished	48—10	
Packaged, plain finish	31—10	
Bulk, plain finish**	63*	
*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.		
**inc. Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.		

**Rivets**

	Base per 100 lb	
1/2 in. & larger	\$3.50	
	Pot Off List	
7/16 in. and smaller	30	

**Cap and Set Screws**

(In bulk)	Pot Off List	
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright	54	
3/4 in. thru 1 in. up to & including 6 in.	43	
1/2 in. thru 5/8 in. x 6 in. & shorter	46	
high C double heat treat	41	
3/4 in. thru 1 in. up to & including 6 in.	35	
Milled studs	16	
Flat head cap screws, listed sizes	34	
Fillister head cap, listed sizes	34	
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53	

**Machine and Carriage Bolts**

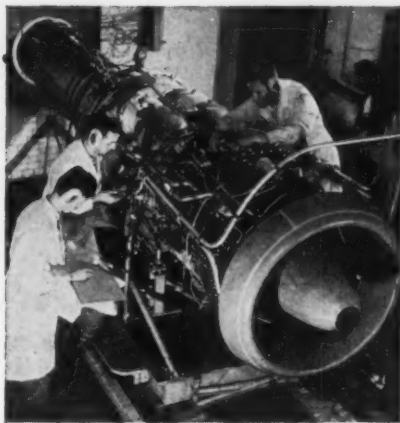
	Pot Off List	
	Less	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2
All diam. longer than 6 in.	14	27 1/2
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	

# MAKE IT ALLOY

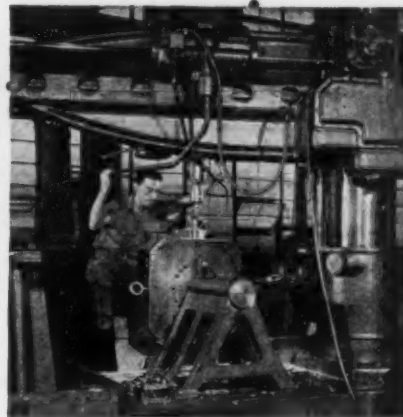
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than ever before.*



**Constructional Alloy Steels**—For greater strength and hardness in crankshafts, springs, transmission gears, countershaft pins, sway eliminator bars, through-hardened bearings and other critical parts, much of the alloy steel used by makers of automotive and farm equipment now contains chromium.



**Stainless Steels**—Every well-known type of stainless—both straight chromium grades and chromium-nickel grades—owes its resistance to heat and corrosion primarily to chromium.



**Tool Steels**—Whether for cutting, hot and cold forming, or die casting, whether the end product is a hand chisel or a forging die, nearly every present-day type of tool steel gets much of its strength and hardness from chromium.

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LANSING 2

"ESTABLISHED 1914"

MICHIGAN

## Miscellaneous Prices

(Effective Apr. 7, 1953)

### REFRACTORIES

**Fire Clay Brick** Carloads, per 1000  
First quality, Ill., Ky., Md., Mo., Ohio, Pa.  
(except Salina, Pa., add \$5.25) \$99.30  
No. 1 Ohio 92.40  
Sec. quality, Pa., Md., Ky., Mo., Ill. 92.40  
No. 2 Ohio 83.15  
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.60) 14.40

### Silica Brick

Mt. Union, Pa., Ensley, Ala. \$99.30  
Childs, Pa. 103.95  
Hays, Pa. 106.10  
Chicago District 122.40  
Western Utah 116.55  
California 122.85  
Super Duty, Hays, Pa., Athens, Tex., Chicago 116.65  
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 17.30  
Silica cement, net ton, bulk, Hays, Pa. 19.60  
Silica cement, net ton, bulk, Ensley, Ala. 18.45  
Silica cement, net ton, bulk, Chicago District 18.45  
Silica cement, net ton, bulk, Utah and Calif. 25.95

### Chrome Brick

Per net ton  
Standard chemically bonded Balt., Chester \$86.00  
Burned, Balt., Chester 80.00

### Magnesite Brick

Standard Baltimore \$109.00  
Chemically bonded, Baltimore 97.50

### Grain Magnesite

St. %-in. grains  
Domestic, f.o.b. Baltimore  
in bulk fines removed \$64.40  
Domestic, f.o.b. Chewalah, Wash.,  
in bulk 38.00  
in sacks 43.70

### Dead Burned Dolomite

Fab. producing points in Pennsylvania, West Virginia and Ohio  
per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ \$13.75

### LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.

Gross Ton  
Openhearth lump \$10.95  
Old range, bessemer 10.10  
Old range, nonbessemer 9.95  
Mesabi, bessemer 9.85  
Mesabi, nonbessemer 9.70  
High phosphorus 9.70

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

### METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.  
Swedish sponge iron c.i.f. 10.9¢  
New York, ocean bags, 12.0¢  
Canadian sponge iron, del's in East 12.0¢  
Domestic sponge iron, 98+ % Fe, carload lots 15.5¢ to 17.0¢  
Electrolytic iron, annealed, 99.5+ % Fe 44.0¢  
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe 60.0¢  
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe 53.0¢ to 80.0¢  
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+ % Fe 83.0¢ to \$1.48  
Aluminum 31.5¢  
Brass, 10 ton lots 30.00¢ to 33.25¢  
Copper, electrolytic 10.75¢ plus metal value  
Copper reduced 10.00¢ plus metal value  
Cadmium, 100-199 lb 95¢ plus metal value  
Chromium, electrolytic, 99% min., and quantity, del'd 33.50  
Lead 7.5¢ to 12.0¢ plus metal value  
Manganese 57.0¢  
Molybdenum, 99% 22.75¢  
Nickel, unannealed 88.0¢  
Nickel, annealed 95.0¢  
Nickel, spherical, unannealed 92.0¢  
Silicon 38.5¢  
Solder powder 7.0¢ to 9.0¢ plus met. value  
Stainless steel, 302 83.0¢  
Stainless steel, 316 11.10¢  
Tin 14.04¢ plus metal value  
Tungsten, 99% (65 mesh) 36.00¢  
Zinc, 10 ton lots 23.0¢ to 30.5¢

Over 85% of the torque wrenches used in industry are

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- Faster—Easier to use
- Automatic Release
- All Capacities

in inch ounces . . . inch pounds . . . foot pounds  
(All Sizes from 0-6000 ft. lbs.)

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Every manufacturer, design and production man should have this valuable data. Sent upon request.

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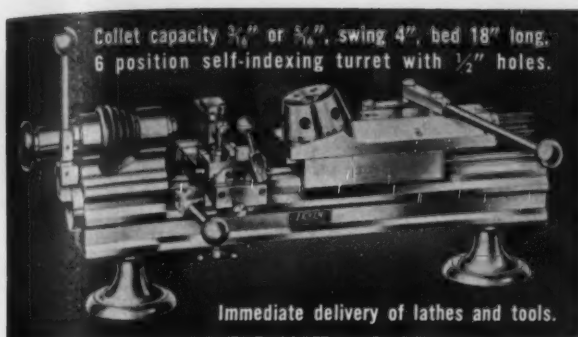
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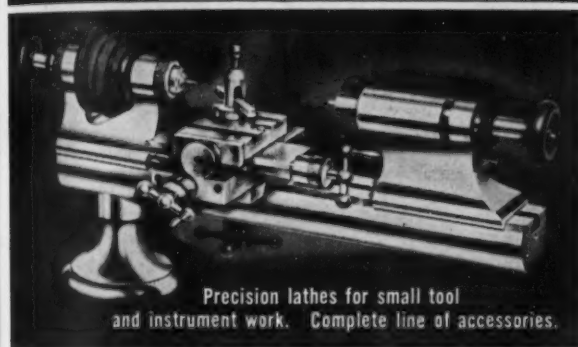
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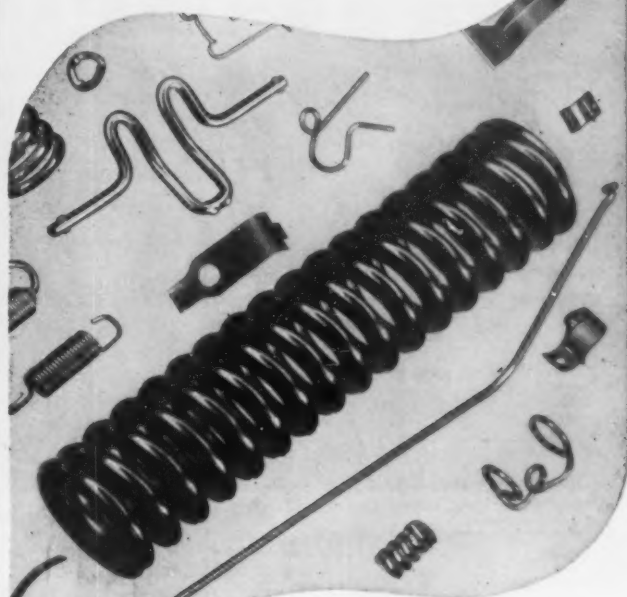
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# Ferroalloy Prices

(Effective Apr. 7, 1953)

## Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65.69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

## S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered. High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	\$1.18
0.50% max. C	1.14
9 to 11% C	1.11

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

## Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe	
Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si	
Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

## CM5Z

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.60-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

## SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.

F.o.b. Johnstown, Pa.	\$225
F.o.b. Sheridan, Pa.	227
F.o.b. Etina, Clairton, Pa.	228
F.o.b. Philo, Ohio	225

Add \$2.80 for each 1% above 82% Mn, subtract \$2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.05

## Spiegeleisen

Contract prices gross ton; lump, f.o.b.

16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$84.00
Pgh. or Chicago	84.00
	\$85.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	\$0.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30 31.50
0.07% max. C	27.95	29.80 31.00
0.15% max. C	27.45	29.30 30.50
0.30% max. C	26.95	28.80 30.00
0.50% max. C	26.45	28.30 29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30 26.50

## Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn

	21.35¢
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## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Add \$1.055 per ton for each additional 0.50% Si up to and including 17%. Add \$1.00 for each 0.50% Mn over 1%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

## Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

## Ferrovandium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus)	3.20-3.25

Alisifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads

Ton lots	9.90
	11.20

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.15
--	--------

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots

	\$4.50
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta

	\$3.75
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Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.22
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Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton

10 tons to less carload	\$65.00
	\$75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.35
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Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	1.82

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$177.00
--	----------

Ferrotungsten, ¼ x down packed, per pound contained W, ton lots, f.o.b.

	\$4.95
--	--------

Molybde oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.

	\$1.14
--	--------

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86 - 89% V<sub>2</sub>O<sub>5</sub>, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub>

	\$1.25
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Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	\$1.00¢
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Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢
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## Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4% Si, 40-45%, per lb contained B

	\$5.25
--	--------

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound

	10.00¢
--	--------

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots

	\$1.20
--	--------

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 10% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	\$1.00
No. 6	.85¢
No. 79	.50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	\$1.45
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered

Less ton lots	\$1.30
Silenz, contract basis, delivered	48.00¢
Ton lots	

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GEAR CUTTING, MACHINE WORK

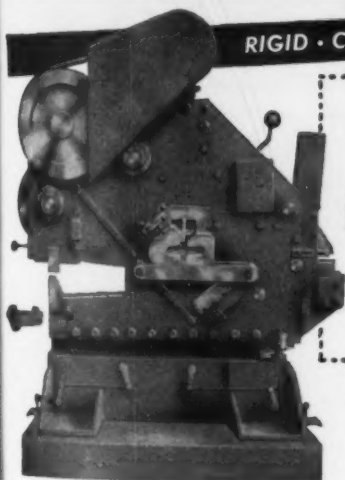
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COMBINATION

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NO PRIORITY  
NEEDED

- Rigidly built of high tensile steel
- All gears are machine cut, forged steel
- Flywheel shaft mounted on ball bearings

PARTIAL SPECIFICATIONS	T 15	T 25	T 30
Punch capacity	7/8" x 7/16"	1" x 9/16"	1-3/16" x 1/2" or 1-1/16" x 5/8"
Shears Plates	7/16"	1/2"	5/8"
Shears Flats	3-3/16" x 9/16"	3-3/16" x 5/8"	4" x 3/4"
Shears Angles (Square Cut)	3 1/8" x 5/16"	4" x 3/8"	5" x 1/2"
Shears Tees	3 1/8" x 5/16"	4" x 3/8"	4 3/8"
Shears Round	1-13/16"	1 3/8"	1 3/4"
Shears Square	1"	1 1/4"	1 1/2"

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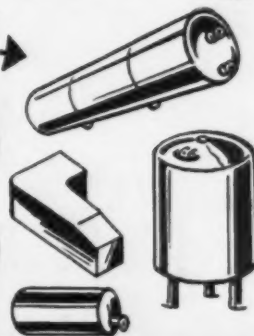
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Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whse.	Mill	600	230/460
1	940	Whse.	QM	250	140/170
1	900	Whse.		250	450/550
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	200/900
2	450	Whse.		550	415
1	400	G.E.	MCF	550	200/1050
2	300	Whse.	CB-5094	230	575/1150
1	200/300	G.E.	MFC	230	360/920
1	200	Rel.	1970T	230	720
1	200	Whse.	CB-5113	230	400/800
1	150	Whse.	CB-3073	230	275/1150
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
10	150	Cr. Wh.	63H-TEPC	230	960
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

## MILL & CRANE

1	50	G.E.	CO-1610	230	725
1	30	G.E.	MD-104AA	230	740
1	30	Whse.	K-5	230	875
4	15	Whse.	K-5	230	630
3	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	6.25	Whse.	K-3	230	680
4	3	C.W.	SCM-FF	230	1750
2	3	Whse.	HK-2	230	835

## A.C. MOTORS

### 3 phase—60 cycle

#### SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1800	G.E.	MT-498	2300	360
1	1500	Al. Ch.		2300	720
1	1200	G.E.	MF-26	2300	275
3	1000	A.C.	Mill	2300	240
1	500	Whse.	CW	550	350
1	500	G.E.	IM	440	900
1	500	G.E.	M-574-Y	6000	900
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1218	2300	435
1	350	G.E.	MT-442Y	2300/4000	253
2	300	G.E.	MT-545Y	2300	900
1	300	A.C.	S-Brg	440	585
1	300	Al. Ch.		440	805
1	250	G.E.	MT-424-Y	4000	257
1	250	G.E.	MT-5598	2300	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	440	585
1	200	G.E.	IM-17	440	600
1	200	G.E.	IM	440	485
1	200	G.E.	MTP	440	1170
1	150 (unused)	Whse.	CW	2300	435
1	150	G.E.	IM-16	440	600
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
4	125	G.E.	MT-568Y	440/2300	435
1	100	G.E.	IM	440	600
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2300	435
1	100	Whse.	CW-868A	440	700

## SQUIRREL CAGE

2	450	G.E.	FT-559BY	440	8570
2	450	Whse.	CS-1450	2300/4150	854
1	300	G.E.	IK-17	440	530
1	200	G.E.	IK	440	865
3	200	G.E.	KT-557	440	1800
1	150	Whse.	CB-8568	440	880
1	150	C.W.		440	930
1	150/75	G.E.	IK	440	900/450
2	125	Al. Ch.	ARW	2300	1750
1	125	G.E.	KF-6328-Z	440/2300	3585
1	125	Whse.	MB	440	485

## SYNCHRONOUS

2	2500	G.E.	TS	2300	357
2	2100	G.E.	ATI	2300	860
2	1750	G.E.	ATI	2300	3600
2	2000	Whse.		2300	120
3	735	G.E.	ATI	2300/12000	680
1	450	Whse.		2300	450
2	350	G.E.	TS	2300	156

## M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	2000	G.E.	500	660	11000
1	2000	G.E.	514	600	6800/12200
3	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	560	275	4400
1	1500	G.E.	600	600	4160
2	1000	Whse.	900	600	4160
1	1000	G.E.	900	250	6600
1	1000 (BU)	G.E.	900	250	2200
1	750	Whse.	900	275	4160
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	900	250	6600/13200
1	500	Whse.	1200	125/250	2300
1	400	Whse.	1200	250	2300
1	400 (BU)	Cr. Wh.	1200	125/250	2300
1	350	G.E.	900	125	2300/4160
1	150	Whse.	1200	275	2300
1	140 (BU)	Cr. Wh.	600	125/250	440/2300
1	100	Delco	1200	120/240	2300
1	100	G.E.	1170	125	220/440

## FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltages
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	25/60	11000/2300

**BELYEA COMPANY, INC.**  
47 Howell Street, Jersey City 6, N. J.

# The Clearing House

## NEWS OF USED AND REBUILT MACHINERY

If War Ends . . . Detroit used machinery dealers are up in the air over the new prospects of a Korean armistice. They are divided over the effect of a Korean peace on business, but as usual, pessimists predominate.

One dealer estimated that 70 pct of his business went to defense work, either directly or indirectly. His first reaction was that if defense orders were cut out, his business would suffer in direct proportion to cut back of defense business. Question is: Will peace in Korea mean sharp cutbacks in defense output? We think not.

Ease Tool Supply . . . A secondary reflection was that strong demand still exists in non-defense business for late model and good condition machinery. A Korean peace would certainly free some of these tools for the used market.

While the effect of the lost market no doubt would over-balance the benefits of greater availability of tools, the end result would not be all bad by any means. It would, however, mean the finish of marginal operators and small brokers who pop up in every crisis and act like procurers rather than dealers.

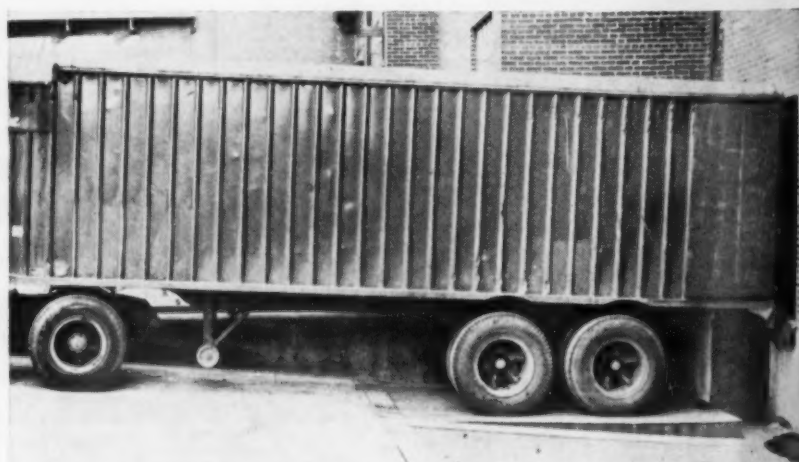
Prices Hold . . . In Detroit, like every other industrial center, dealers are weighing the effects of de-control and report that it had no immediate influence either on prices, the market, or in bringing out new equipment.

Tool room lathes, larger engine lathes, milling machines and surfaces grinders continue to be in demand.

Want Presses . . . In recent weeks the demand for presses has been excellent. This is no doubt tied in with the tremendous auto production and the need for stampings to keep up with automotive requirements. Demand is still strong, but is expected to lose strength momentarily as requirements are met.

Make Spot Report . . . The Detroit Chapter of Machinery Dealers National Assn. is experimenting with a list of "late arrivals" in hands of Detroit dealers.

This list is to be circulated among the membership with the idea of stimulating business between members when acquisitions can be checked against each dealer's own inquiries.



TRUCK LOADING and unloading is said to be made easier by an adjustable platform which raises the rear end of a vehicle to dock level. Introduced by Rowe Methods, Inc., Cleveland, the Adjust-A-Truck is designed for firms that do not have enough room on or in front of their docks to install adjustable ramps. Set into the pavement in front of the dock, Adjust-A-Truck raises vehicles to the desired height by means of an electric hydraulic system. All operations are controlled by pushbutton. Available in 9 x 12 ft and 10 x 12 ft platform sizes, capacity of these units is 40,000 lb.